

1st RIWET Exchange of Experience Event (EEW) & Kick-off



The RIWET Kick-off meeting and Exchange of Experience Workshop-1 (EEW-1) took place in Drenthe, NL on June 25-26 2024. It was a 2-day event coordinated by the RIWET Lead Partner, the Province of Drenthe, which included project introductory sessions and field visits to the river Hunze valley and raised bog peatland areas in Drenthe to discuss with stakeholders and learn from Good Practices.

Natural Countryside Programme (2022-2027)

On the first day partners were welcomed to the raised bog peatland area of Bargerveen. First, project partners Gerard Meijers and Cornelia Vermeer presented the Natural Countryside Programme (2022-2027) (Programma Natuurlijk Platteland). The Province of Drenthe wants to improve the Natural Countryside Programme in such a way that it is more in line with the introduction of the National Environment and Planning Act. It is necessary to think about participation and forms of cooperation at an early stage. Agricultural nature management is an instrument that contributes to the international obligations under the Birds and Habitats Directives and the Water Framework Directive as well as to the attractiveness and experience of rural areas. Together with the waterboards, the Province of Drenthe is looking for maximum synergy between the Natural Countryside Programme, the WFD, the Future-Oriented Agriculture Programme and the revised National Environment and Planning Act.

In RIWET Drenthe will experiment and develop knowledge by carrying out projects in the different sub-areas 'Hunzedal' and 'Bargerveen'. In the case of Bargerveen this could be the development of paludiculture between the different bog remnants at both sites of the DE-NL border, connecting water buffer zones, or improving internal dikes which contribute to further improvement of the water level management. In the Hunze river catchment area, the aim is to enhance local cooperation in order to create high-quality nature together with Nature trust organisations, waterboards and private landowners.

Paludiculture as nature-based solution

To get some inspiration on paludiculture as nature-based solution, Gert Jan van Duinen from the Foundation Bargerveen was invited.

“Paludi” comes from the Latin “palus” meaning “swamp, morass” and "paludiculture" as a concept was developed at Greifswald University, Germany. Paludiculture is a sustainable alternative to drainage-based agriculture, intended to maintain carbon storage in peatlands. This differentiates paludiculture from agriculture like rice paddies, which involves draining, and therefore degrading wetlands.

In Europe peatlands have been assessed as the most degraded ecosystem type (European Commission). Damaged peatlands are a major source of greenhouse gas emissions, responsible for 5.6% of global human-caused CO₂ annually, more than aviation and shipping combined. Peatland loss also means biodiversity loss, more floods and droughts, and degraded drinking water for local communities. As it is expected that clean drinking water will get scarcer in the future, and floodings more severe, the capacity for water purification, storage, and retention that peatlands provide will only become more valuable in the future.

Vast areas of agricultural peatlands in Europe are used for intensive meat and dairy production. In addition, there is forestry and e.g. potato cultivation on drained peatlands. These business models only work when the peat soils are continuously drained. Drained peatlands emit large amounts of CO₂, because of decomposition of the organic material that sequestered CO₂ in the past. Stopping drainage and raising the water table reduces CO₂ emissions. At the same time the emission of methane may increase. Methane is a short lived, but strong GHG so its effect is time dependent. The graph below shows that, although methane emission may increase in the short term after rewetting, the reduction of net GHG emissions from peatlands can only be achieved if we rewet all drained peatlands as fast as possible (Günther et al., 2020).

This means that farmers and landowners have to change their drainage based business model to cultivation of crop species that thrive under wet conditions. These wetland crops are referred to as "paludicrops".

<https://sites.google.com/view/c-toolbox/components-of-the-toolbox/paludiculture>

Rewetting and proper management of degraded peatlands can reverse most of these negative effects, although this poses a huge challenge. If the goals set in the 2015 Paris Agreement (i.e. carbon and climate neutrality by mid-century) are to be met, almost all currently drained peatland needs to be rewetted and restored. This is not only a large area (about 50 million hectares), but it also needs to be done within limited time, requiring the rewetting and restoration of almost two million hectares per year. It is crucial to create and share sustainable ways to manage peatlands that can both protect our environment and provide a viable future for landowners and farmers. Carbon Connects presents state of the art business models and tools that enable a smooth transition towards a more sustainable use of peatlands.

Main stakeholders are farmers/landowners (ownership and management of peatlands); local authorities, incl. water authority, municipality, region, province (spatial planning, water management, water purification, water retention, biodiversity/Natura 2000, GHG reduction); state and EU (subsidies and regulations, agreements). Customers using the harvested biomass include (bio based) building companies, peat free growing media producers, textile industries; carbon farmers.

Authorities involved in paludiculture support the further development and implementation of paludiculture as a land use method. They recognize that paludiculture offers significant opportunities, but is still in the early stages of development, both in practical implementation on the site and in product and market development, as well as in regulations and subsidy schemes. Although the advantages cannot yet be conclusively evaluated from the various perspectives, the wet use of peatlands is the single sustainable way forward for today's drained peatlands. Considering the targets to reduce GHG emissions, to meet the targets of the Water Framework Directive, to develop a climate robust landscape (storing peak rain events, prevent flooding, retain water to reduce drought stress), we must change from drained to wet use of peatlands. In buffer zones next to wet nature reserves, like raised bogs and fens suffering from drainage, paludiculture is a good practice that helps to improve the hydrological situation in the nature reserve. Paludiculture during several years or decades can help to reduce the nutrient load in fertilized peat soils, prior to the development of more natural/biodiverse ecosystems.

The financial resources required to set up and to run paludiculture strongly depend on the current situation in the landscape or hydrological system. Rewetting of drained peatland can be much more cheap than continuing lower water tables by means of dykes and pumps in polders, but can also be expensive if construction of dykes and pumps are necessary in case on neighbouring land drained use will be continued. The management (maintenance, harvest) of paludiculture and the processing of the biomass will become more efficient (reduced cost per unit), when working on larger scale within the region.

Rewetting of drained peatlands is the only way to reduce or stop GHG emission and soil subsidence and the transform to a more climate robust land use. Nature restoration/conservation is an option in the future, sustainable wet use, but paludiculture may be a good alternative, either for a limited period of time to reduce nutrient loads, or for a longer period to maintain productive use (harvest of biomass).

For a good video explaining Paludiculture click here:

<https://www.greifswaldmoor.de/aktuelles/how-to-paludiculture.html>

Buffers in Bargerveen

After lunch and a visit to the sheepfold the Official Kick-off RIWET was executed by Jordan Jumelet, Manager for Rural Areas at the Province of Drenthe. He welcomed all project partners and stressed that Bargerveen is a great place for recreation and leisure activities. Biking and walking are favourite activities, but because of the large amount of protected birds, it's also very popular with birdwatchers.

Gerard Meijers, project leader of Bargerveen developments then explained about the area, before partners went on their bikes to explore the area themselves.



The area is being developed because it is a Natura 2000 area with the objective of restoring raised bogs. The Forestry Commission is the owner and the municipality of Emmen, the

Vechtstromen water board, the province of Drenthe, LTO and local residents are closely involved.

Due to desiccation as a result of low water levels in surface water and the groundwater levels around the area due to agriculture and buildings, the peat layer that gives the area its characteristic character of raised bogs and upper peat grasslands is disappearing.

The desiccation must be stopped, and that can only be done by sealing off the area and ensuring that the precipitation that falls in the area does not disappear or flows away. By working well together with other authorities, site managers and contractors, a plan was devised that could be implemented quickly. To this end, a development plan had to be drawn up, permits had to be arranged and money had to be made available.

The plan stipulates that a quay would be built around the area and of course material had to be found there, which would be buried and closed at ground level. For this purpose, loam was found that was released elsewhere as waste.

The project costs were approximately 2 million euros and were financed with European funds from PAS Natura 2000 and POP-3 Rural Development and by contributions from the province of Drenthe and the Vechtstromen water board.

The plan preparation was done by the engineering firm Arcadis and Prolander, the implementation was supervised by engineering firm Sweco and Prolander. The final manager and site owner is Staatsbosbeheer.





1. Starting point at restaurant Wollegras/Sheepfold
2. Buffer West – development of a buffer for Bergerveen for the purpose of more stable groundwater levels under the peat and to create a discharge to the South buffer. Explanation by Gerard Meijers
3. Geological monument – centrally located in the peat area, explaining the restoration work of, among others, the Kamerlingswijk, old sheepfold and Meerstalblok development. Explanation by Klaas van den Berg
4. Buffer North – one of the first fully-fledged and working buffers. Explanation by Tjeerd Dijkstra
5. Border Quay – On the cycle path near the restored border stone, provide an explanation about the tourist use of the Bergerveen in combination with nature restoration (internal and external buffering by waterproof quays with cycle and walking paths and entry options for the site manager and for example the fire brigade. Explanation by Henriëtte Vrieling
6. Buffer South – explanation of the process: planning in the context of GGOR, the land exchange and the planning process of the buffer South. Explanation by Carolien van de Bles.

Visiting the Hunze valley, learning from the Hunze vision

The second day started with a bus trip to Zuidlaardermeer at the northern part of the Hunze valley in Drenthe, and heading southwards back to Emmen.

Here Cornelia Vermeer, project leader for the Hunze Valley for the Province of Drenthe, introduced the Hunze Vision, (<https://hunze.drenthe.nl/landschapsvisie/>) the Steering Committee Hunze and the role of private landowners.



In the river valley of the Hunze (north-eastern part of The Netherlands) wetland restoration takes place on a relatively large scale. Restoring the river Hunze with its characteristic river processes like flooding and sedimentation are important elements. In some parts of the river valley restoration of mesotrophic fens fed by calcareous groundwater is in preparation. Important in this process is the different view on water management in the area. Together with water conservation, creating areas for water storage and improvement of water quality the recovery of eutrophic fens and the lake Zuidlaardermeer takes place. Furthermore groundwater abstraction and nature development are going hand in hand in the area, to a certain extent. The first ideas of wetland restoration, implemented 15 years ago, have already led to some new nature reserves in the area, for example the Annermoeras. One of the reasons for this success is the cooperation between the different organisations responsible for nature and water management. Some characteristic species have already returned in the area. It is expected that within 10 years a large part of the river Hunze will be restored.

The Hunze catchment area was not a natural catchment area anymore, but a straight canal passing through the area to abduct water. No inundation areas were left. The reason was to create better agricultural land and efficiently detain peat. This led to some great floodings and years with too much water to handle, some dikes collapsed and the flooding infiltrated the city of Groningen - with huge damages as a result. Also, biodiversity levels (aquatic and on land) in the area decreased significantly. This realisation led to a vision on restoring the Hunze river system (by the two 'landscape organisations').

The vision is carried out and adopted by the people and land users in the region close to the river. A so-called 'string of pearls' – a series of linked projects – was designed to restore water quantity and quality, allowing space for naturally inundated areas, wetlands and, besides buffering, also ensuring good quality levels to retain drinking water. The Province had the assigned an organisation to execute the realisation of the projects - with the involvement of all

stakeholders. The projects that already had the most land bought could start with transforming and carrying out (or implementing) necessary measures.



Tusschenwater, one of the pearls

The vision gives perspectives on structural improvement for agricultural use with a dynamic landscape in which water and a natural river system is a guiding principle. It also includes the restoration of meandering , g groundwater streaming and intervention between high-level sandy Hondsrug and the catchment area of the Hunze. Not only nature would benefit, but also all living creatures, many species and humans (the users and the inhabitants of the direct area) too. Of course, all stakeholders involved had their goals implemented too, i.e. the waterboard, drinking water company, landscape organisations, municipalities, Province, recreation organisations, SMEs (agricultural/recreation).

From 1998, 11 projects were executed and realized in the field. More than 500,000m³ of water can be stored in those projects, wetlands. A lot of bird species- specifically meadow and wetland birds – are no longer threatened as numbers are increasing in the area.

Fish migration has improved and the biodiversity on aquatic and land flora and fauna has increased. But, in particular, the quality of water and groundwater streaming and quantities have improved significantly. Landowners and all other stakeholders are working together on the problem as they see the success of projects. Many species of marsh birds have settled in the wetlands of the new nature reserves. Mammals such as beaver and otter have also found the area. Of the higher plants, the area is of great importance due to the presence of the very rare *Carex* species *Carex cespitosa*, which has been saved from national extinction by the construction of new nature reserves. In addition, the redevelopment of the Hunze area offers opportunities for the development of species-rich grasslands and marshes.

The best of this practice is that the creation of the Hunze vision brought all stakeholders together, now everyone is looking in the same direction. This was done by describing the

problem in detail – giving a lot of information on each ‘layer’ of the area, - putting that together and transforming it into a practical document with principle guidelines. From there, water conservation and restoration, and all other aspects of the area are joined to provide a strong basis for the projects – the ‘string of pearls’ for wetland restoration.

Please also watch [this video](#) for more information/explanation.

LOFAR

The LOFAR location is former agricultural land that has been changed into nature, in joint cooperation with private company/research organisation ASTRON.

In the context of the restoration of nature and landscape in the entire Hunze area, opportunities have been explored to restore nature on the flank of the Hondsrug ridge and the stream valley. Until the Second World War, large-scale swamps existed here that were influenced by mineral-rich seepage water.

One of the areas where restoration of water management seemed to offer good opportunities for nature recovery was the section between the villages of Buinen and Exloo. Here was an area with a high seepage pressure. Moreover, we knew from old data that there was once a very rich flora here, consistent with seepage-fed raised bogs and swamps. The problem, however, was that there were no options within the provincial nature policy to purchase land.

At that time, the institute for space research Astron was looking for space in the Northern Netherlands to set up a large-scale antenna project in a region where there was little influence from external sources. An empty area, so to speak. Their eyes fell on the area that we now know as Lofar.

The Province of Drenthe, the Drentse Landschap Foundation, Astron and the Municipality have jointly supported this project to not only set up a new radio telescope, but to combine it with the realization of a large nature reserve of approximately 400 hectares on the flank of the Hondsrug.

There was a very small nature reserve in this area (0.25 ha) with some species characteristic of poor grassland. It was the only nature reserve in this very large region. The reserve was severely dried out, many species had disappeared.

The development of the area was completed in 2008 and the small reserve was included in the new nature reserve. A very rich nature reserve has now developed with numerous special plant and animal species. For example, six species of orchids grow there, along with species such as common cotton grass, round-leaved sundew, cross-leaved heath, lousewort, marsh lousewort and grass of Parnassus. It is also a very rich bird habitat - bird watchers from far and wide come to the area...

The redevelopment has created a seepage swamp with a high seepage pressure of mineral-rich groundwater. This has created a type of nature that has become very rare in the Netherlands. There are even signs that point to the development of mesotrophic raised bogs.

This practice provides insight into how science-based organisations or institutes can contribute greatly to such developments in the region by not only doing what they do best technically, but by also connecting stakeholders and creating an added value to the educational information and the experiences on (eco)system services (by incorporating natural values). For example, giving guided tours through the nature area with the telescopes, explaining the astronomic aspects and highlighting the unique natural elements specific to the area. Connecting ‘the whole world and beyond’ to a small area in the Hunze.

Feedback from partners

Municipality of Cesena, Italy – big differences with cases. We don't invest as much resources in nature and rivers – another issue is lack of political support. Nature is seen more as antagonist of economic development. Municipality needs to engage more citizens. There is a river Po authority and one that looks after maintenance and flood security. Very top down approach – we would like to change this. Impressed by the precise integral vision of the Hunze. The vision is the guiding principal and helps to keep everyone on course. Also, we see the importance of keeping all stakeholders on board.

EKBY, Greece – very relevant with what we are trying to achieve. We'd like to hear more about the exchange of agricultural land for nature –the Prolander story. Perhaps in webinars with Prolander including all partner stakeholders. We like the multi-purpose approach (combining functionalities). We struggle with quantity of water – hard to combine needs of farming with needs for nature/biodiversity. We like that you focus on small areas. We admire that the vision is actually above the imposed directives. We see that the regional approach is the way to go , connecting smaller areas to create a bigger area. Participatory approach would be valuable to exchange (in webinar?).

The targeted policy instrument for Greece within RIWET is the Common Agricultural Policy Strategic Plan of Greece 2023-2027 (CAP SP) and, in particular, its provisions which relate with the protection and restoration of wetland ecosystems. As such, the 1st Exchange of Experience Workshop (EEW) was directly linked with our case study, with particular differences due to divergent conditions between Greece and Netherlands. For example, water management in the Drenthe province and Greece have quite different purposes. In Greece, it is of high importance to provide water for the agriculture production during the dry months of summer, competing with the minimum flow of rivers and water level of lakes that is essential for species and habitats requirements. While, as we understood, in the Drenthe Province, water is managed in order to rewet and restore the peatlands, enhancing the regional biodiversity. However, concerns of drier conditions currently with climate change are now more evident in the Netherlands, as we were informed. Regardless the different conditions, we recognize areas for which the exchange of experience was very useful and inspiring. Below, we summarize the main lessons we took back home:

The good practice of Paludiculture, presented as a pilot case for the restoration of drained peatlands that allows farmers to make profitable production (i.e., reeds for biomass or as constructive material) and restore ecosystem services of the peatland, could be further explored in Greece in the context of the good agricultural practices for peatlands that need to be developed in the context of the current CAP SP. In this direction, it would be useful to integrate the paludiculture practice in RIWET webinars and give the possibility to a wider audience of our stakeholders to learn more about it.

Besides, we see as a very important task that paludiculture is promoted in the context of the Drenthe Natural Countryside Programme. Greek CAP SP gives the opportunity to form task forces, within the measures of innovation and collaboration, in which paludiculture could be proposed as a pilot case for the restoration and sustainable agriculture of a peatland, with the collaboration of many stakeholders spanning across different levels including farmers and researchers. Also, we see very relevant to enlist and promote more systematically within our SHG meetings the alternative agricultural practices that fit most to the standards of the CAP SS on wetland protection i.e., no-till farming on lake shores, biological farming in peripheral zones of wetlands, or other relevant measures.

The restoration plan of Hunze river which is implemented within the Drenthe Natural Countryside Programme is a good practice, by itself, with several lessons to be learned and further projects to be inspired from it. At first, the long-standing commitment of all the interested parts, the policy makers and competent authorities of Drenthe Province, towards a nature conservation and restoration vision that integrates all relevant policies (i.e., Natura 2000 measures, Water Framework Directive, agricultural nature management measures) and focuses on the cohesion between nature within and outside protected areas. The participatory approach followed in shaping the Hunze river vision seemed to have engaged all relevant regional stakeholders that are part of it and efforts continue in order to be part of it. This co-creation among stakeholders of divergent interests ensures a more complete and holistic image of the landscape.

Similarly, within the Greek CAP SP, there are provisions for the farmers in order to contribute to nature conservation either by respecting the Statutory Management Requirements set by the EU Birds and Habitat Directives in case they are active within Natura 2000 sites, or by implementing the Good Agricultural and Environmental Standards (GAECs) in order to receive the relevant subsidies, and by applying eco-friendly practices (i.e., eco-schemes, agri-environmental and climate measures) that may regard unprotected wetlands that enhance the landscape elements inside their farmland. The Greek CAP SP finances investments regarding the improvement of the efficiency of water use in irrigation, which have to be integrated in the regional Water District Management Plans of the Water Framework Directive and be implemented by relevant regional and local services. From the example of Natural Countryside Programme, we see as a useful input the collaboration and partnerships among different bodies for the realization of the Drenthe vision.

The practice for the exchange of agricultural land for restoring peatlands or the alternative solution that farmers may have to retain their property and become nature conservators, is very much interesting and is at the heart of ecosystem restoration priority that EU sets. First, we learned that small changes matter too; especially when restoration of many small areas gradually accumulates. This inspires us to explore how the eco-scheme programs of the old and new Greek CAP SP that integrate conservation of small wetlands in farmlands have a positive impact to biodiversity and connectivity. Also, we find as very interesting the partnership of Drenthe Region with PROLANDER Company and would like to learn more from their experience with the farmers. In this direction, it would be useful to integrate the PROLANDER practice in RIWET webinars and give the possibility to a wider audience of our stakeholders to learn more on this. For example, we would like to link such kind of experience exchange with our plan to integrate agricultural practices that ensure the maximum benefit for the farmer and the wetland, in the professional consultation of farmers, which is carried out within the Greek CAP SP. For this consultation process responsible is the Agricultural Research Institute of Greece, who are engaged in our RIWET stakeholder network.

Finally, we see the work that Drenthe Province is doing with a wide range of stakeholders, including farmers, citizens etc. as very relevant to our pilot case. We acknowledge from the existing management schemes i.e., of Natura 2000 sites, that this is of imperative importance. In our case within RIWET, we will make use of SHG meetings in order to create a network of interested parties and stakeholders for wetlands and agriculture, to promote the new wetland standards, provisions and opportunities of the Greek CAP SP, to exchange our views and open new dialogues with farmers, authorities, and scientists.

TRT, Ireland - Great to see the Nature Programme and achievements with stakeholders from different sectors – very interesting to hear how you deal with landowners. – Mitigation and compensation. Prolander represents the Province –involving NGOs from the beginning of the process. Your work is quite advanced so use this example to showcase in other projects and with landowners. It would be good to remove all invasive species before restoration starts.

REVIVO, Slovenia - It was interesting to hear how the Province of Drenthe, with some local partners, includes various stakeholders in the early stages of preparing and developing management measures. This approach is uncommon in Slovenia, where stakeholders are typically not included at the beginning of the process. Another fascinating aspect was the existence and development procedure of the Natural Countryside Programme for each province in the Netherlands, as we do not have such programs. It was interesting to learn that the programme includes measures which contribute directly to the objectives in the National River Basin Management Plan.

Paludiculture as nature-based solution: Although paludiculture has been presented as a Nature-based Solution (NbS), this classification is somewhat misleading and it should not be promoted as such. The primary goal of paludiculture is still the production of native or non-native biomass for various economic uses. As presented also at the EEW, non-NbS measures, such as water management through engineering practices like water manipulation (accumulating water in lakes), production of non-native plants, using fertilizers,...

However, it is important to recognize that paludiculture is a more sustainable alternative to traditional farming practices in wetland areas. It contributes partially to peatland restoration efforts, accounting for about 4% of such measures in the Province of Drenthe. Additionally, paludiculture represents a significant shift in land management practices for many farmers and landowners who are looking to reduce their negative impacts on the environment. This approach can encourage a broader acceptance of sustainable land use and help in transitioning to more environmentally friendly agricultural practices.

Buffers in Bargerveen: The scale of planned conservation activities by the Province of Drenthe at the Bargerveen Natura 2000 site is inspiring. It is also encouraging to see the support of local residents in implementing such projects and their understanding of the need and purpose of these actions, such as drought prevention, decreasing CO₂ emissions, saving water, supporting peatland biodiversity, etc..

Visiting the Hunze Valley was another fascinating experience. It was particularly intriguing to learn that the Netherlands purifies its water without using chloride or microfiltration, thanks to the wetlands. However, due to climate change causing intense but brief rainstorms and limited water resources, they have begun constructing numerous drinking water pumping stations in anticipation of worsening trends.

Simultaneously, efforts have been made to raise awareness among the increasing general public about the importance of giving more space to rivers and allowing them to meander through the valley as they naturally would, which will also positively impact groundwater levels and with that quantity and quality of their drinking water for them and all the future generations.

The collaboration of the Prolander company, which initially started as an NGO, in managing both national and private agricultural lands in the Province of Drenthe was also an intriguing new practice. This model could potentially be adopted in Slovenia as well. I appreciate their comprehensive

support for farmers—from conceptual design to execution—and their monitoring of compliance with management agreements. Which is a thing that is often lacking in Slovenia.

Another interesting piece of information was that the first restoration project, which aimed to recreate meanders for the Hunze River, initially created meanders that were too small or narrow, leading to the project being deemed unsuccessful. It was encouraging to see that the project planners learned from these mistakes and had another opportunity to apply their knowledge in a second project. In this subsequent effort, they extended the river and created wider meanders, which proved to be more effective.



LOFAR is a great example of combining nature conservation with another activity that requires significant space, such as radio telescopes. It was rewarding to observe wild meadow orchids and diverse bird fauna in the area, along with the efforts to designate the region as a new nature reserve. I hope to see many of so restored peatlands in the future.

Overall, it was fascinating to hear about and witness in practice these exemplary practices, which could and should be partially adopted and incorporated into Slovenian national policies. I particularly appreciated the widespread recognition of the importance of conserving and restoring peatlands and lands close to the rivers, which historically were considered worthless among both the general public and farmers. In the past, we had the "luxury" of completely altering landscapes to suit our needs. However, we are now entering an era where preserving, restoring, and maintaining ecosystem processes is paramount at any cost. This is essential to ensure that the lands we have inhabited for centuries remain suitable for our children and future generations.

University of Latvia - The key takeaway from the presented good practices is the crucial role of early-stage collaboration among various stakeholders. Equally important is having a shared vision co-created with these stakeholders, clear guidelines, and an iterative approach that incorporates lessons learned and adapts strategies accordingly. Currently, we lack a unified vision for implementing nature and water protection measures in Latvia. Despite the aims of River Basin Management Plans, many projects remain uncoordinated, poorly discussed, and inadequately monitored, thus failing to improve water and nature management.

One of the highlighted good practices was paludiculture, presented by Gert Jan van Duinen from the Foundation Bargerveen. Most agricultural peatlands in Europe are managed through drainage, which damages peatlands and deprives them of vital ecosystem services. Paludiculture involves cultivating wetland crops on rewetted peatlands, aimed at maintaining carbon storage and preventing CO₂ emissions. This practice aligns with the EU Green Deal's goals to mitigate climate change-related risks such as floods and droughts. Approximately 12% of Latvia's territory consists of peatlands, with around 39,500 hectares classified as degraded and needing revitalization (Stivrins et al.). Currently, Lithuania, Latvia, and Estonia are among the largest emitters of greenhouse gases from degraded peatlands in the EU, collectively exceeding 50 million tonnes of CO₂ equivalent annually. To meet the demand for substrates, peat extraction occurs on 0.04% of Latvia's territory, equating to 4% of the country's peatland area. Latvian peat extraction companies are required by their mining licenses to recultivate the peatland after extraction, which may involve converting the area into a waterbody, reforesting it, or restoring it to its natural state. This recultivation process can take several decades, and unfortunately, companies often declare bankruptcy to avoid the high costs of restoration. While some companies invest in restoration processes long before required, they are the minority. Voluntary approaches should be encouraged, but there is also a need for national oversight and legal instruments to ensure the restoration of extracted areas. Although suitable areas for paludiculture exist in Latvia, current legislation and national policies in environment, agriculture, forestry, and climate need adaptation to fully support these activities.

Most paludiculture projects in Latvia are pilots and rarely published, monitored, or compared at the national level. These pilot projects should be continued and developed in a more scientifically sound manner, with results discussed with policymakers. The exchange of experiences between European countries, such as through the RIWET project, is valuable for fostering paludiculture implementation in Latvia and showcasing good examples and lessons learned.

Jordan Jumelet, Manager for Rural Areas at the Province of Drenthe, and Gerard Meijers explained Bargerveen's development efforts to restore the Natura 2000 raised bogs. A collaborative plan was devised to seal off the area and retain precipitation by constructing a quay using locally sourced loam, addressing desiccation caused by low water levels.

The scale and detail of the project, along with stakeholder involvement and acceptance, are inspiring. For Latvia, this project exemplifies the importance of groundwater in maintaining healthy raised bog ecosystems. Currently, the EU Water Framework Directive (EU WFD) implementation in Latvia does not consider raised bogs as groundwater-dependent ecosystems, unlike in Estonia, where even degraded raised bogs are recognized as such. The methodology to identify groundwater-dependent ecosystems for EU WFD implementation was developed in 2020 through collaboration between Latvian and Estonian water managers, scientists, policymakers, and biodiversity experts (Interreg Estonia-Latvia GroundEco project).

This example demonstrates the water cycle's importance, as even though raised bogs are not directly fed by groundwater, a constant groundwater level is essential for their existence. This example could prompt discussions to reconsider including raised bogs as groundwater-dependent ecosystems in the assessment of groundwater bodies and the development of Latvian River Basin Management Plans. This would ensure wider wetland protection.

Cornelia Vermeer, project leader for the Hunze Valley, introduced the Hunze Vision and the role of private landowners in wetland restoration. Large-scale wetland restoration in the Hunze river valley focuses on restoring natural river processes like flooding and sedimentation. A key element is the restoration of mesotrophic fens fed by calcareous groundwater, highlighting the importance of groundwater and groundwater-dependent ecosystems.

The integration of groundwater abstraction and nature development enhances both environmental and human benefits. For example, a healthy wetland ecosystem reduces the need for drinking water pre-treatment. The Hunze Vision includes a "string of pearls"—linked projects to restore water quality and quantity, ensuring good drinking water retention and supporting a dynamic landscape. This vision has united stakeholders, including water boards, municipalities, and recreation organizations, to collectively improve surface and groundwater management and restore the natural river ecosystem. The cooperative effort among various organizations has been crucial for the project's success, with clear guidelines and a shared vision ensuring acceptance among diverse stakeholders.

The main success story here is the joint vision and early-stage collaboration between various stakeholders. In Latvia, many projects aim to meet the EU WFD goals but are scattered and not well disseminated. Moreover, there is a lack of trust among locals due to late involvement in projects and poorly discussed aims and activities among stakeholders, creating resistance to conservation measures. Project implementers often avoid public discussions due to fear of resistance. Time dedicated to setting clear goals and guidelines and timely involvement of all stakeholders creates a sense of ownership and ensures the success of restoration projects. Additionally, coordinating restoration actions as linked projects with diverse activities aimed at reaching an overarching goal is crucial.

The LOFAR project transformed former agricultural land into a nature reserve through the collaboration of ASTRON, the Province of Drenthe, the Drentse Landschap Foundation, and the Municipality. Historically, the area was known for its large-scale swamps fed by mineral-rich groundwater seepage and rich flora and fauna. The project not only revived a previously dried-out reserve but also fostered a diverse habitat, home to species such as wild meadow orchids. The rich biodiversity and the development of rare mesotrophic raised bogs highlight the ecological success of this initiative. This endeavour showcased how scientific organizations can contribute to ecological restoration while engaging stakeholders and providing educational opportunities. We appreciate the combination of scientific and ecological efforts that offers a model for future peatland restoration projects, emphasizing the importance of groundwater in creating and sustaining healthy ecosystems. This approach aligns with one of the Latvian good practices that will be demonstrated in EEW-2 (voluntary spring monitoring), where scientists are key participants in ensuring the implementation of the EU WFD.



⇒ Implementor: ProLanders
of PI Nationale Natuur Programme

- Created area Province Drenthe + Groningen through land purchases + swaps
- ProLanders brought all stakeholders together: farmers, state organisation, local communities, umbrella organisations (farmers) public/private/state

Good Practice:

- Nbs + Restoration works
- upscaling was done gradually leading to landscape scale action, stabilising the ecosystem

challenges: - trade-offs to accommodate all stakeholder wishes.

* Use different instruments. e.g. buying land from retired farmers, land swap, develop land use plans to convert from agricultural to natural land.

Province funds it, and ~~land~~ ProLanders develops the plans + works

* Other regions [Ireland, Germany, ^{Albania} Latvia, Greece] don't have a comparable national programme that includes different sectors. (H₂O, Air, Soil, Biodiversity)

* Q: Are there additional Nature networks in the countries beyond Natura 2000 (country specific aims?)

- * National Parks Albania + Ireland
- * Blue dot areas (Ireland)

⇒ Strong instruments needed to achieve consensus between ~~part~~ stakeholders for nature restoration.

Added value partners

- (F) → Coöperatie
→ how to organize?
→ government to big role

- (L) → education locals
→ more attention on springs
→ watermanagement: - government, university
- locals
→ organized by government → research

- (P) → Agricultural, local watermanagement
→ Rente water → farmers
→ local partnership

- (NL) → Stakeholders in projects → locals
→ Waterships → SBB
→ Municipality → Farmers

- (SL) NGO : 1' create coöperation
→ Ministry → plans
→ use App

- Policy improvement

guidance
national level
integrated
plans

- Biodiversity

- water quality

combine
challenges
+
solutions

- Peatland restoration

involving
farmers
&
land users

time
effort
needed
interests
stakeholders

- nature restoration river

cooperation
for
benefits
inhabitants

- water retention

understanding
knowledge
bottom-up
engagement

Floods → manage

nature-
based
solutions

✓ nature-based solution — security