

# REWET-WETLAND OBSERVATORIES FOR THE REWETTING OF DRAINED PEATLANDS

# ReWet

**Wetland observatories for rewetting of drained peatlands**

Roadmap for Research Infrastructure 2020



# CONTEXT

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Peatlands are carbon rich (organogenic) soils. When drained, the CO<sub>2</sub> (and other GHGs) are released into the atmosphere. Over the past century, vast areas of peatlands have been drained to make place for agriculture. Rewetting of these lands is expected to stop most of the GHG emissions

Globally the EU is the second largest emitter of greenhouse gases (GHG) from drained peatlands (15% of total global peatland emissions). Peatlands form the largest single emission sources within the European land use sector.

In Denmark up to 50% of agriculture's GHG emissions stem from drained peatlands (DN) : Target to rewet 100.000 ha of drained land in coming years.

Many drained peatlands become increasingly unproductive over time. Considering this, and the GHG reduction potential, rewetting is a low-hanging farmer-supported fruit for meeting DK 70% by 2030 GHG reduction goals. **Policy priority**

# A MOSAIC OF CHALLENGES

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The rewetting of drained peatlands constitute a mosaic of complexity, and pitfalls (that may have negative effects if not better understood), including:

- biodiversity concerns
- biomass utilisation
- Livestock grazing
- hydrology, including effects of rewetting on neighbouring areas and infrastructure
- nutrient leaching (high P concentrations and ammonium loads) into aquatic systems – lack of data on areas with P problems
- misplaced criteria for soil carbon content
- legislation, land management (scattered land holdings/multifunctional land consolidation).

These factors render the pursuit of solutions very place-based and knowledge intensive.

# REWET

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- 5 year project (2021-2025), appx EUR 1 mill
- National Infrastructure project
- Aarhus, Copenhagen, Rostock Universities – linked to AnaEE

## Objectives

**Overall:** Lower GHG emission, lower nutrient loads, increased biodiversity

**Specific:** What works where, why and how?

Research infrastructures at ecosystem scale for studies on peatlands under various management practices before and after re-wetting

Four observatories in agricultural and forest peatlands will measure GHG emissions, energy, water, nutrients, biodiversity changes?

Outcomes will guide land-use policy and practice.

# LIVING LAB DIMENSIONS

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- Complexity mosaic renders the pursuit of solutions very place-based and knowledge intensive, lending themselves to a co-creational/living lab approach. Various co-creation models currently at play
- Clear and well demarcated territorial/ecosystem/landscape characteristic (river valleys, bogs etc)
- Heterogenous selection of stakeholders and often high levels of social capital such as in (common) property regime institutions (e.g. drainage associations), farmers associations, nature conservationists
- Strong desire to solve problems at all levels. Need for scientific inputs

# WHAT MAKES THIS AGROECOLOGY?

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- **Paludiculture** is key to sustainability in re-wetting endeavours: cultivation of water tolerant/adaptive crops (often reeds, grasses, willows) and utilisation of biomass from wet and rewetted peatlands. Embodies agroecological principles – nature-based, ecological optimization, low-input cultivation, perennials with positive impacts on carbon stocks and biodiversity
- **(Circular) bioeconomy** as an economic driver of agroecological transition by maintaining the productivity of vulnerable land and supporting livelihoods.
- Paludiculture biomass utilisation in short supply chains, converted into value added products and/or with nutrients re-used through conversion e.g. biorefinery.
- A Rewet site has facilities for biorefining at lab scale and at large demonstration scale. A farmer's cooperative is developing paludiculture-based utilisation of biomass for bioenergy, and for biorefining of grasses into higher value products.

Need to co-create local circular bioeconomy models, farm scale implementation of flood-adaptive crops and growing techniques. Research to enhance understanding of carbon, nutrients and hydrology needed.

# THE REWET OPPORTUNITIES & AMBITIONS

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Current actors mainly (1) research based and (2) public authorities

Access open to external users along the lines of AnaEE principles

Similar challenges across Europe (and beyond): Paludiculture based biomass utilization in short supply chains seen as a key to rewetting action; models for implementation needed

Just started and mouldable: Ambition to integrate with wider stakeholder group and the wider (transdisciplinary) rewetting complexity, gradually assuming living lab features

Rewet challenges include how to tackle and possibly adopt LL features such as 'co-creation', becoming more user centered etc. Expect to build capacity as part of the pilot network





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