

trans4num INSPIRE Hackathon 2026

INNOVATION CANVAS

Team: Low-hanging Fruit

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Our solution in one sentence:

We propose a topographical gradient strategy working with the natural flow of the landscape to catch, use, and filter nutrients before they reach the Limfjord.



Funded by
the European Union

GOAL

Future landscape concept

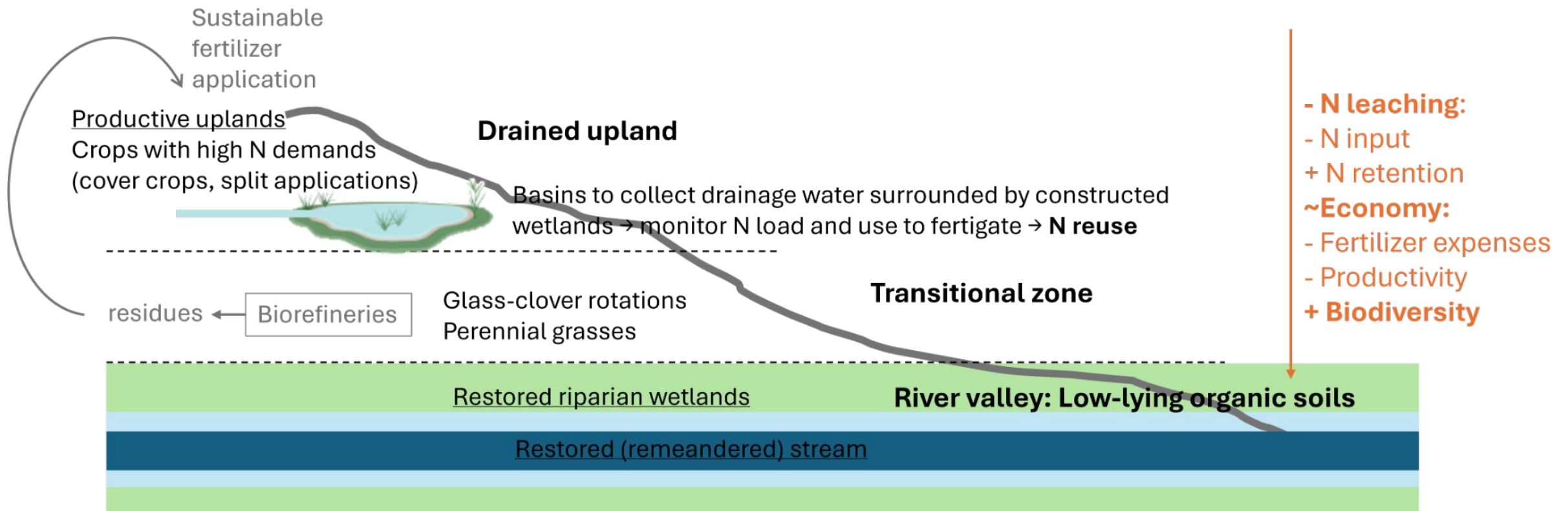
“Terraced” landscape based on the topography/water flow, using the gradient of the land to filter nitrogen out before reaching the fjord.

Productive agriculture facilitated by NBS and strategic take-out.

Our innovation in one view

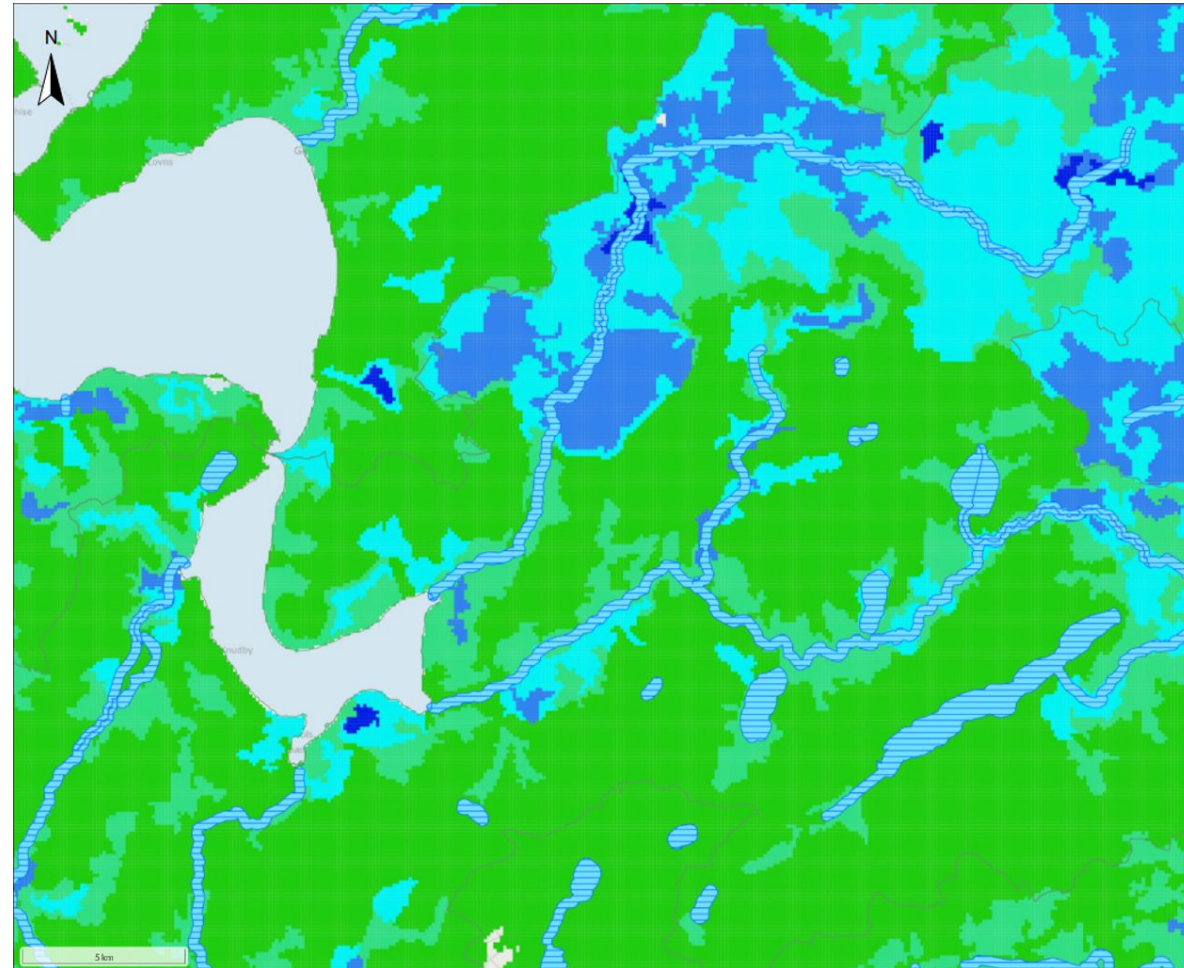
Identify and address low N-retention at subcatchment-scale with circular N use.

Future landscape concept



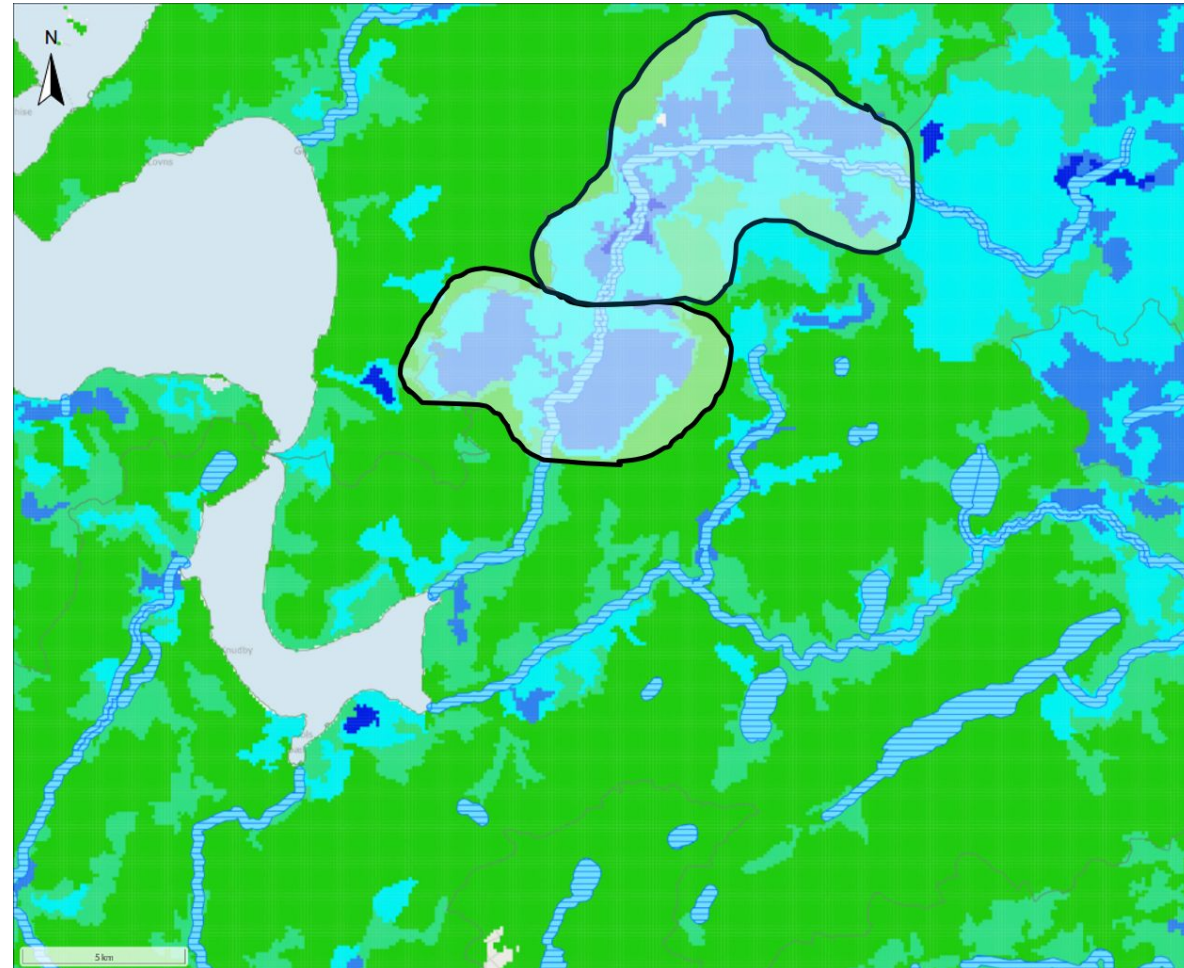
Future landscape concept

- High Variability in N retention at local scales



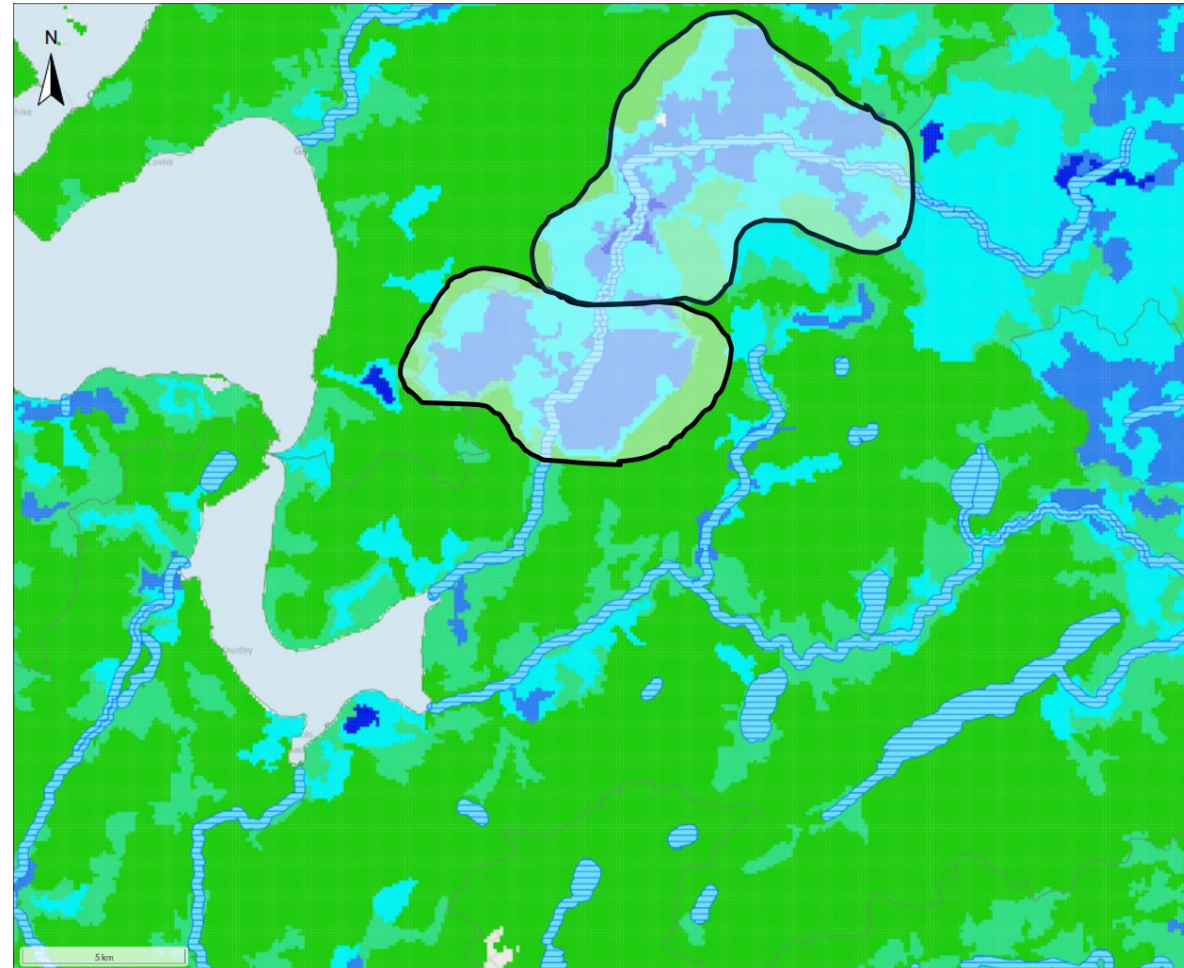
Future landscape concept

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- How can farmers use AI tools to rapidly create tailor made scenarios/solutions (NBS etc.) for their specific subcatchment?



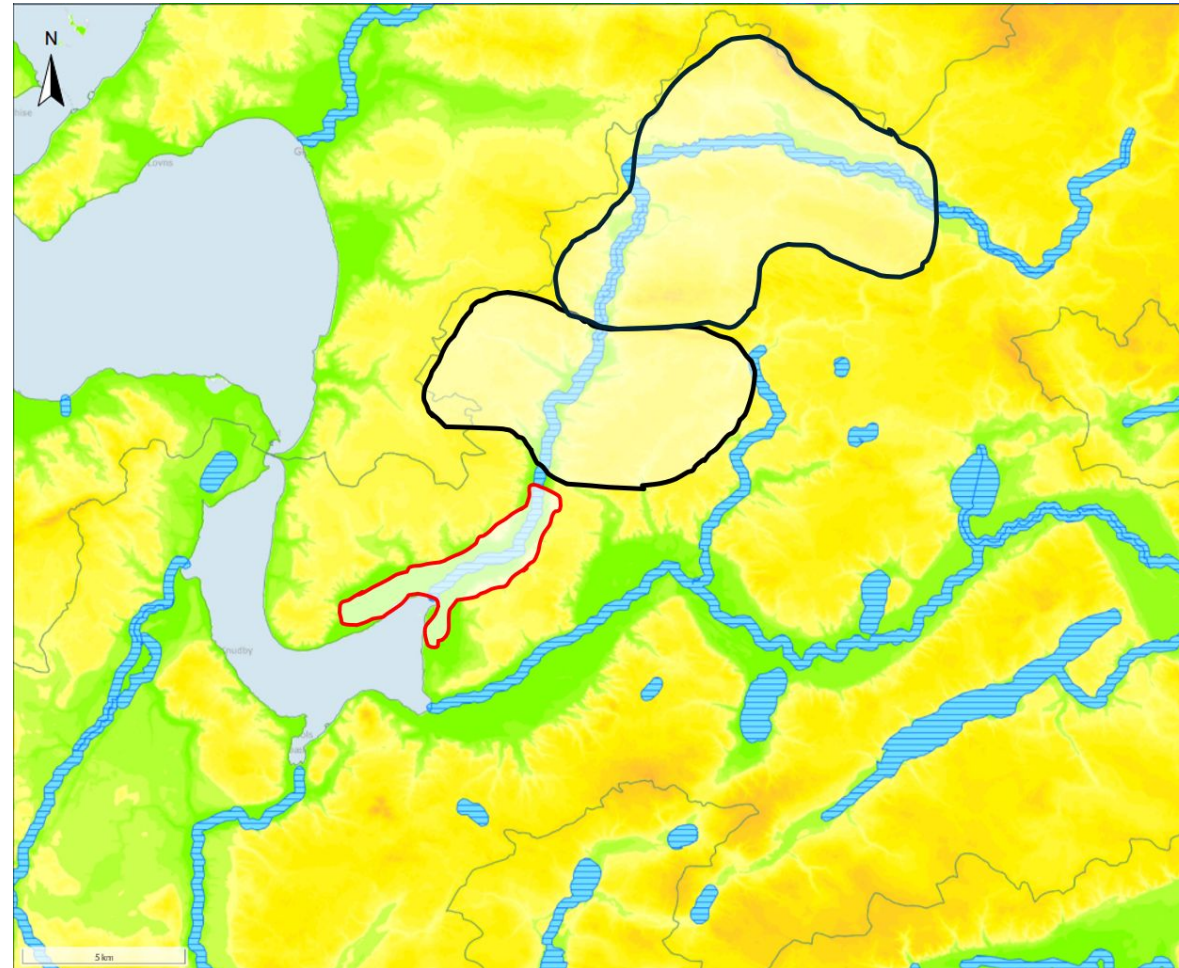
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- Jackdaw, DST, Data availability?



Future landscape concept

- High Variability in N retention at local scales
- How can farmers use AI tools to rapidly create tailor made scenarios/solutions (NBS etc.) for their specific subcatchment?
- Jackdaw, DST, Data availability?
- N Retention complexities



1|2|3|4|5

OUR INNOVATION IN ONE VIEW

1. THE PROBLEM

We want to solve...

high N leaching into waterways, economic losses
connected to renaturing

2. THE SOLUTION

Subcatchment-scale strategies with AI tools

3. THE BENEFIT

This will help because...

lower N input, higher N retention

higher biodiversity

Local Empowerment, sense of ownership

4. THE FARMER

Farmers will adopt it because...

shared identity, shared N responsibility, quotas

5. THE TRANSITION

To make it happen, we need...

Dataset availability

Organization at river/subcatchment scale

1. THE PROBLEM

Main challenge

What specific primary problem in the Limfjord catchment does the solution target? *(e.g., severe nitrate leaching on sandy soils, dependency on imported feed proteins, continuous emissions from drained peat soils)*

severe N leaching from drained upland areas into the Limfjord

Why is this important?

Who is most directly affected by this challenge?

☐ Farmers

☐ Municipalities

☐ Limfjord Water Ecosystem

☐ Downstream Bio-industries

2. THE SOLUTION

Nature-based solutions

Measure / Element	Landscape placement	Core function (N-retention, biodiversity, carbon, feed)
1. Runoff retention basins	Uplands	• More precise nitrogen application • Split applications rather than a large early dose • Harvesting of excess runoff
2. Grass/Clover fields	Midlands	• This will improve the soil's ability to hold on to more stable forms of carbon • The crop can be harvested three times a year for use in biorefineries
3. Constructed lowlands	Lowlands	• Rewetting drained organic soils • Restoring floodplain storage • Constructed wetlands at drain outlets • Reconnected meanders and shallow side channels (+residence time)

2. THE SOLUTION

Nature-based solutions

How do these measures function together as an interconnected system?

1. **The Uplands** practice source control and trap runoff in collection basins before it leaches deep into the ground.
2. **The Midlands** act as a biological sponge using deep-rooted grass-clover rotations to scavenge residual nutrients while feeding regional biorefineries.
3. **The Lowlands** serve as the final filter, where retired soils and saturated wetlands use natural denitrification to convert nitrates into harmless nitrogen gas before water hits the fjord

3. THE BENEFITS

Expected impacts & Trade-offs

Anticipated multi-benefits:

Nitrogen reduction:

- reduced N leaching from upland areas
- increased N retention on lower levels (perennial plants, wetlands)

Biodiversity enhancement:

- rewetting and stream remeandering in river valleys increases biodiversity

Climate & Soil health (C-Sequestration / GHG cuts):

- reduced CO₂ emissions from rewetted lowlands

Farm economics & Income:

- Farmers on high land keep similar production levels
- Farmers on lower levels get funding from CAP Pillar II finance

3. THE BENEFITS

Expected impacts & Trade-offs

Identified Trade-Off or Bottleneck: *(e.g., reduction in cereal acreage, upfront processing facility costs, temporary yield adjustments)*

How does your design mitigate or manage this trade-off?

4. THE FARMER

Farmer adoption & Business case

Why would a local farmer actively adopt this solution?

- [x] New commercial income streams (*e.g., green biorefinery protein, biogas feedstock*)
- [x] Reduced expenditure on synthetic fertilizers and imported protein feed
- [x] Compliance with tight national nitrogen quotas and EU Water Framework Directive mandates
- [x] CAP subsidy eligibility (*e.g., eco-schemes, agri-environment-climate commitments, wetland support*)

What is the single biggest barrier to farmer adoption, and how do you overcome it?

5. THE TRANSITION

Role of digital tools & Spatial evidence

How did the available tools and data inform your design choices?

Jackdaw GeoAI Platform:

Decision Support Tool (DST) / Regional Spatial Data:

5. THE TRANSITION

Key innovation & Strategic recommendations

Top 3 action steps to enable implementation:

Farm / Advisory level:

Regional / Market level (biorefineries, processing hubs, farmer cooperatives):

biorefineries

farmer cooperatives

Policy / Regulatory level (targeted subsidies, eemitting, land consolidation):

1|2|3|4|5

OUR INNOVATION IN ONE VIEW

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We want to solve...

2. THE SOLUTION

We propose...

3. THE BENEFIT

This will help because...

4. THE FARMER

Farmers will adopt it because...

5. THE TRANSITION

To make it happen, we need...

Q&A

Discussion