

Typha as a resource for insulation

Value chain

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Peatland perspectives – Circular bioeconomy

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Better Wetter: peatlands living lab



NGO's/citizens



provinsje fryslân
provincie fryslân



Regional governments



Education/academics

Farmers



Netwerk Noordoost

Altenburg & Wymenga

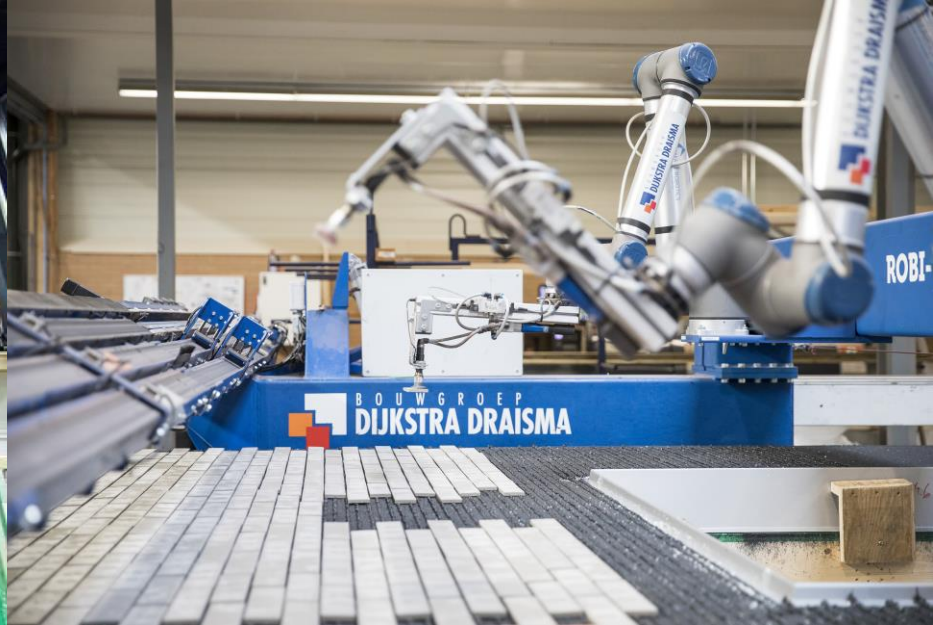


Studio Tjeerd Veenhoven

Entrepreneurs



Profitable land use under wet conditions



Typha products: biolaminate



(photo: Waterschap De Dommel)

Better Wetter Typha for insulation



Typha products: insulation material (blow in)



(photo: Coen Verboom, Bouwgroep Dijkstra Draisma)



Insulation with typha

1. No fall in

2. Biologically stable

3. Competative price



(photos: Coen Verboom, Bouwgroep Dijkstra Draisma)



Value chain: Typha for insulation material



Typha culturing and mowing



(photos: Jesse Wagenaar, VHL)



Drying and shredding



- Thermal drying by fossil fuels?
- High costs and CO2 emissions
- Pressing into bales: high fraction of fines, not suitable for insulation (low recovery percentage)

(photos: Jesse Wagenaar, VHL)

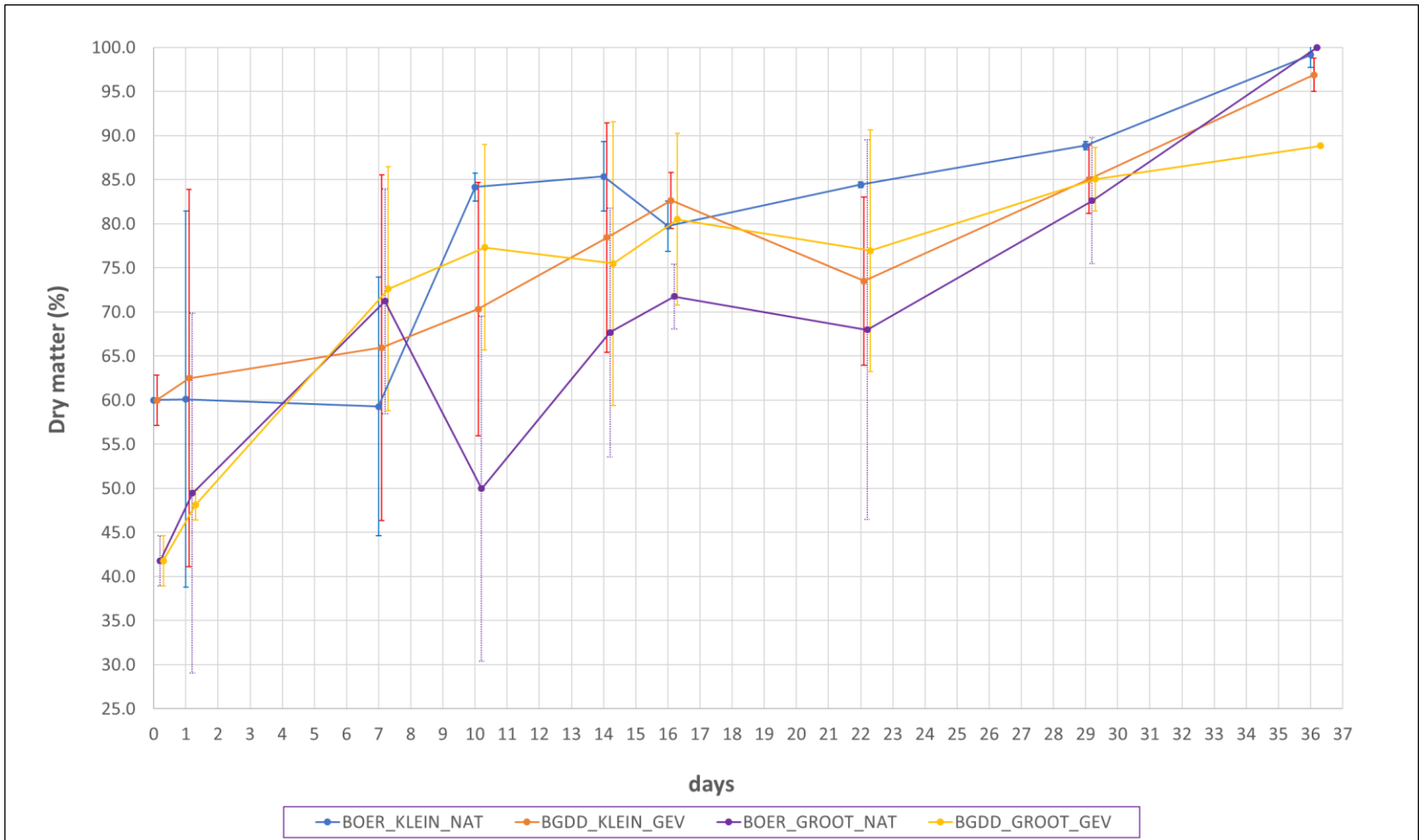


Need for alternative drying and shredding



(photos: Jesse Wagenaar, VHL)

Drying by air



Sieving and conservation



(photo: Doetje de Jong, Gemeente Dantumadiel)



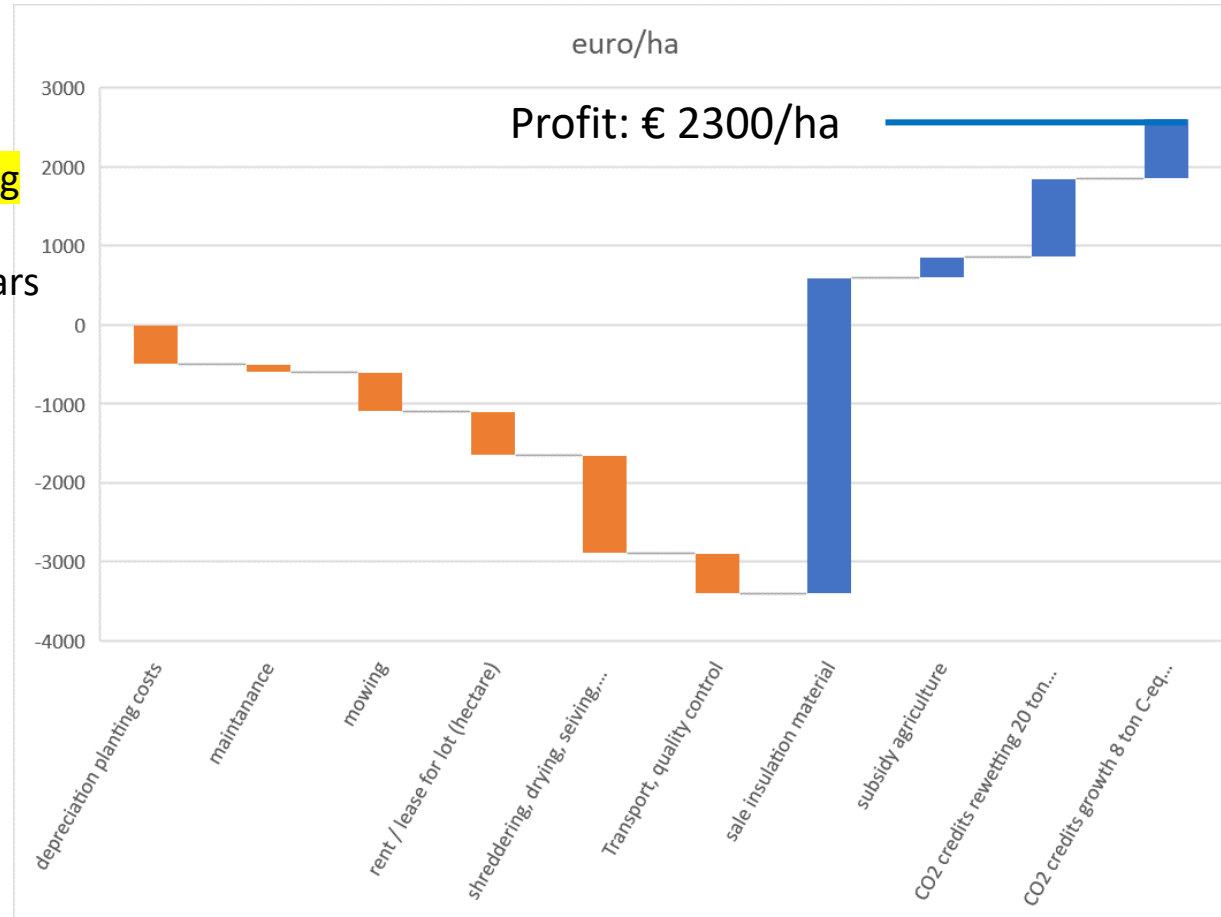
Costs and benefits: determining factors

Factor	Influenced by:
Production rate Typha (yield)	Local nutrient conditions, water management
Recovery / fraction suitable for insulation	Optimizing production process
Price insulation material (ready to use)	Market (consumers based), availability competitive materials
Planting costs	Scale, Innovation in mechanisation
Maintenance during growth	Scale, local conditions
Mowing costs	Scale, local conditions
Costs for shredding, drying, sieving	Optimizing production process
Land costs, rent or interest	Local conditions
Carbon credits to be claimed (C-eq/ha)	GHG-emission reduction (rewetting, biomass production)
C-credits price	C-credit market (producers based)
Subsidies	Governmental policies

Costs and benefits: euro's (premises)

Premises:

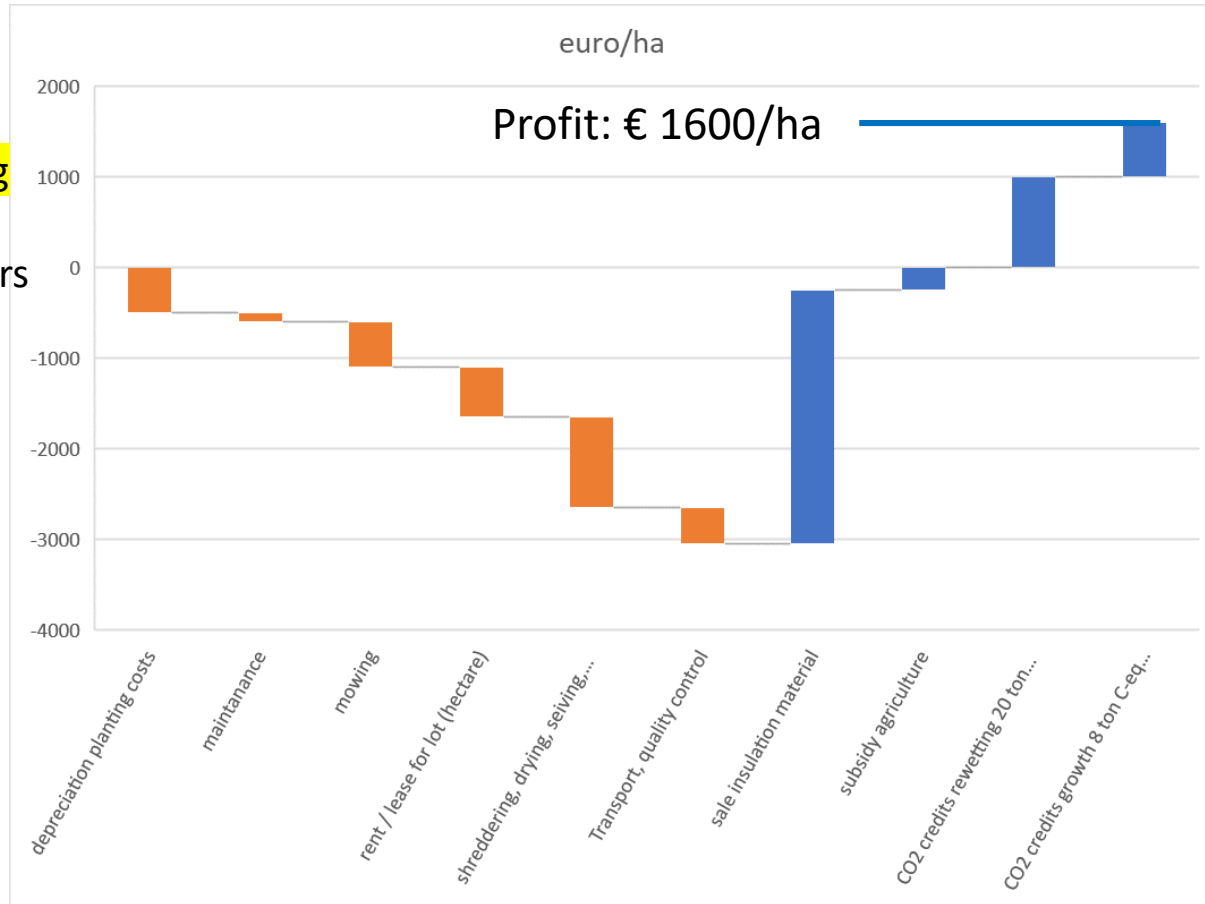
- Production: 7.5 tonnes dm/ha.y
- Recovery: 67%
- Sale insulation product: € 0.80/kg
- Investment (planting etc.): € 10.000/ha, depreciation 20 years
- Land costs (e.g. rent/lease): € 550/ha.y
- Maintenance: € 100/ha.y
- Mowing: € 500/ha
- Shreddering, drying, sieving, conserving: total € 0.25/kg
- Transport, quality control etc.: € 0.10/kg
- Carbon credit: € 50/ton C-eq
- C-credit rewetted 20 ton/ha.y
- C-credit growth 15 ton/ha.y
- Subsidy agriculture: € 250/ha.y



Other premises, other outcomes

Premises:

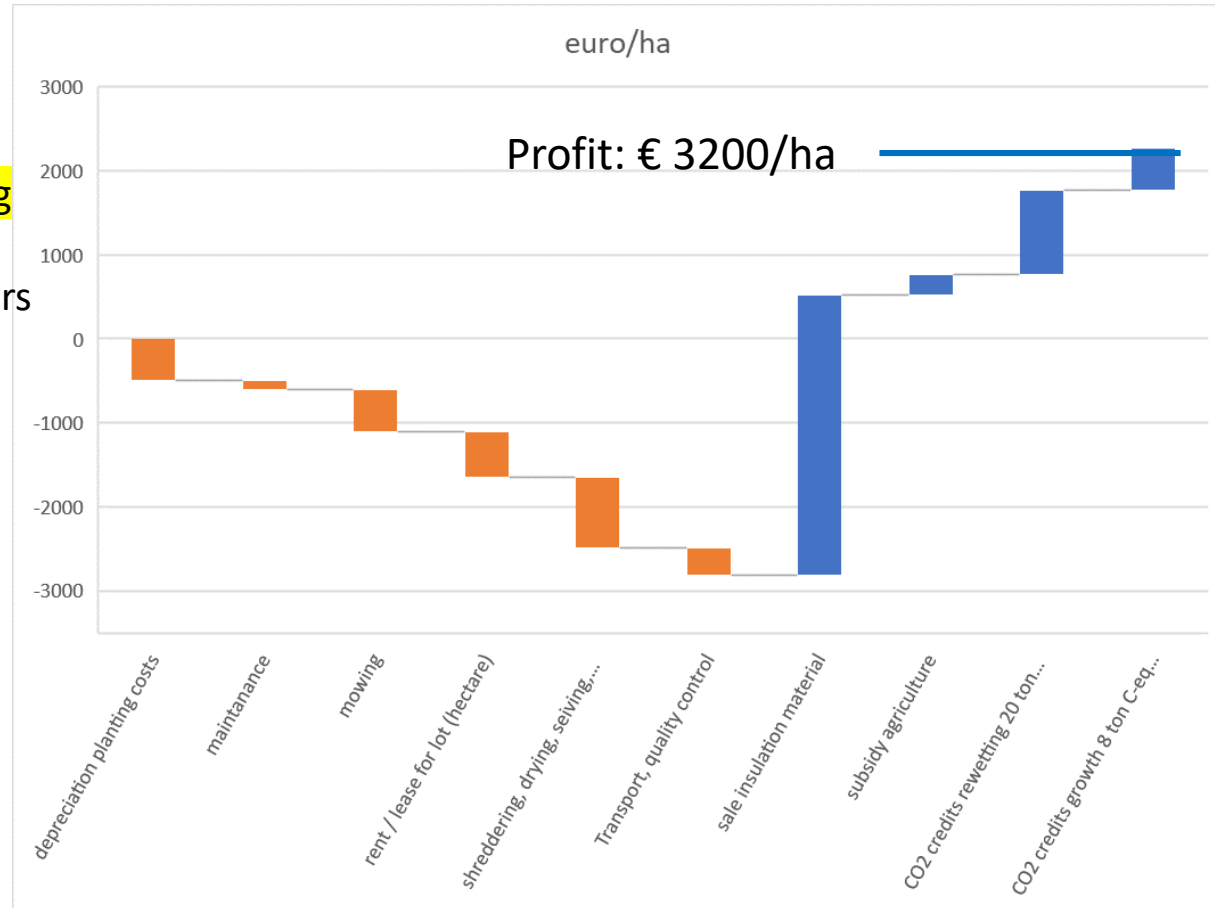
- Production: 6 tonnes dm/ha.y
- Recovery: 67%
- Sale insulation product: € 0.70/kg
- Investment (planting etc.): € 10.000/ha, depreciation 20 years
- Land costs (e.g. rent/lease): € 550/ha.y
- Maintenance: € 100 /ha.y
- Mowing: € 500/ha
- Shreddering, drying, sieving. conserving: total € 0.25/kg
- Transport, quality control etc.: € 0.10/kg
- Carbon credit: € 50/ton C-eq
- C-credit rewetting 20 ton/ha.y
- C-credit growth 12 ton/ha.y
- Subsidy agriculture: € 250/ha.y



Other premises, other outcomes

Premises:

- Production: 9 tonnes dm/ha.y
- Recovery: 67%
- Sale insulation product: € 0.80/kg
- Investment (planting etc.): € 10.000/ha, depreciation 20 years
- Land costs (e.g. rent/lease): € 550/ha.y
- Maintenance: € 100 /ha.y
- Mowing: € 500/ha
- Shreddering, drying, sieving. conserving: total € 0.25/kg
- Transport, quality control etc.: € 0.10/kg
- Carbon credit: € 50/ton C-eq
- C-credit rewetted 20 ton/ha.y
- C-credit growth 18 ton/ha.y
- Subsidy agriculture: € 250/ha.y



Market volumes

- Ca. 500 kg insulation material per house.
- 1 hectare = circa 10 houses per year (7 – 13).
- 1.000 houses per year = circa 100 hectares

Source: Algemeen Dagblad, 17-02-21

€ 1,3 miljard verduurzaming woningen en gebouwen

De aarde warmt op. De CO₂-uitstoot moet omlaag. Hoe gaan we dit realiseren? Voor 2050 zijn al onze woningen en gebouwen aardgasvrij. Dit betekent dat we onze huizen beter gaan isoleren en duurzaam gaan verwarmen. Vanaf 2022 komt ruim € 1,3 miljard beschikbaar. Dit geld wordt ingezet voor:



Ministerie van Binnenlandse Zaken en Koninkrijksrelaties



€ 514 miljoen Een nationaal isolatieprogramma
Voor zowel koop- als huurhuizen

€ 288 miljoen Uitrol hybride warmtepompen
Een hybride warmtepomp vermindert het aardgasverbruik met ongeveer de helft

€ 525 miljoen Verduurzamen maatschappelijk vastgoed
Dit geld wordt ingezet voor bijvoorbeeld scholen, ziekenhuizen en politiebureaus



▲ De woningbouwproductie moet flink worden opgeschroefd. Woningbouwers, projectontwikkelaars en andere woonpartijen hebben daar afspraken over gemaakt. © Marc Bolsius

Woonakkoord gesloten voor bouw van 1 miljoen huizen

De 25 grootste branche- en belangenverenigingen in de woningbouw hebben gisteren een akkoord gesloten waarin staat dat tot 2030 maar liefst 1 miljoen huizen moeten worden gebouwd. De afspraken die ze daarover samen maken zijn ook een oproep aan de politiek om de juiste voorwaarden te creëren en met extra geld over de brug te komen.

Source: Ministry of internal affairs

Typha culture: values for society

- **Income opportunities for specific locations:** fields that are too wet for (dry) agriculture/grass production, due to higher groundwater levels applied to decrease GHG emissions and subsidence rates.
- Opportunities for **regulating ecosystem services**, e.g. waterretention, water purification capacities depending on design and location (situational)
- Opportunities for **restoring biodiversity**, depending on design and location (situational)

Economic and societal (ESS) values depend on local situation: e.g. nutrient availability, scale and landscape integration. Different approaches:

1. Wet agriculture: high yields (tonnes dm/ha), need for sufficient nutrient input (soil, water) and proper water management. Focus: high production per hectare. Higher costs?
2. Temporary Typha culture: transition ‘from agriculture to nature’. Focus: Nutrient mining/removal, landscape improvement, biodiversity. Limited yields?



Conclusions

- Value chain: simple and local, low investments
- Increasing demand for sustainable, biobased insulation products.
- Maybe (?) tension between market demands (efficient production) and society demands (biodiversity, landscape etc.)?
- C-credits, subsidies and or increased insulation product prices are necessary to make the value chain profitable for both farmers and product producers. (Combination of credits and subsidies possible?)
- Role of governments: Policies that supports sustainable (incl. profitable) land use under wet conditions. E.g. by facilitating C-credits certification for farmers.

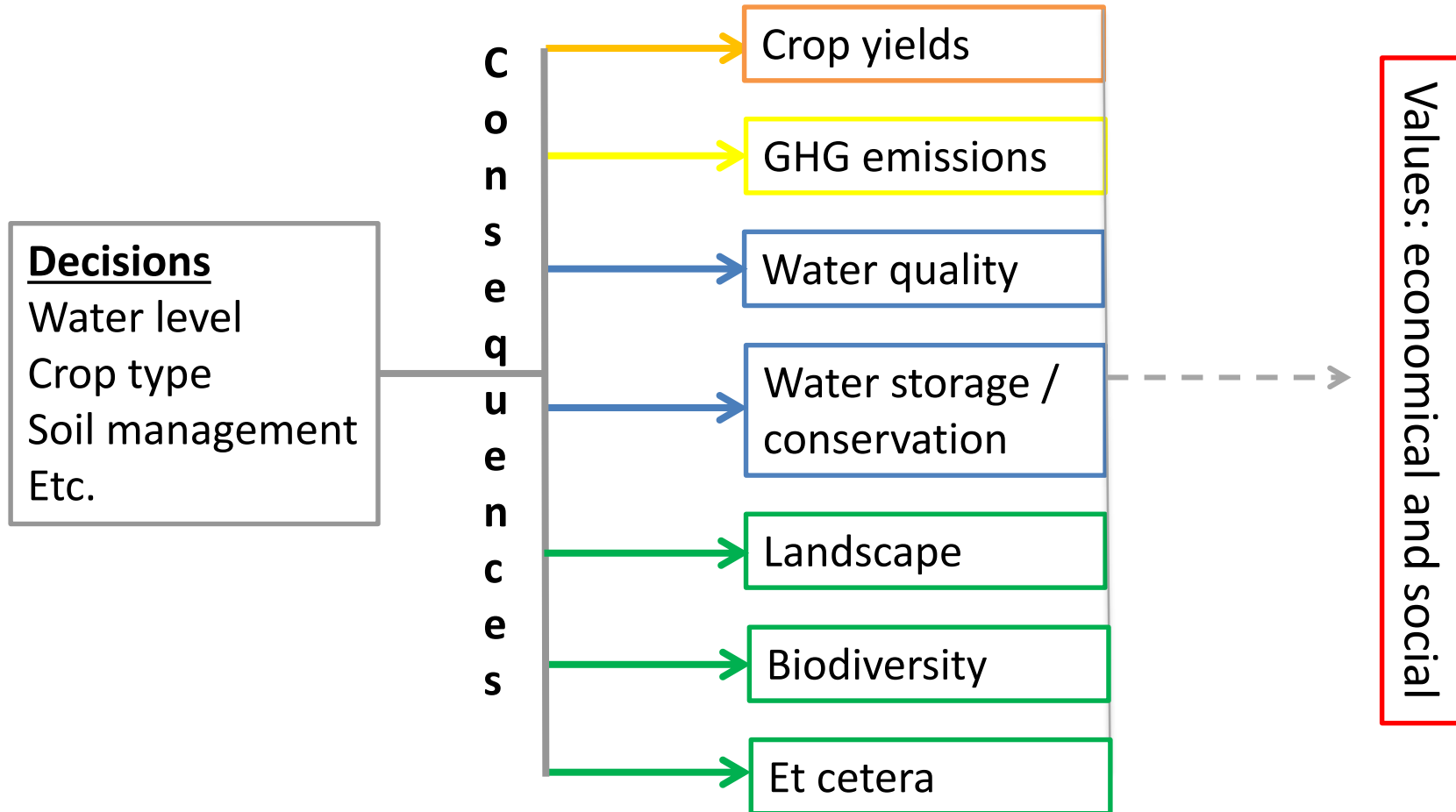


Insights and developments needed

1. Better insights in costs (esp. planting) and benefits (esp. Typha yields) variation in practice, under different conditions (scale, landscape integration), at different locations.
2. Better insights in the effects of nutrient availabilities on Typha yields (tonnes dm per ha).
3. Further development: valuing ecosystem services for sustainability transitions. Translating societal values into money, to make wet land use profitable for farmers / land-owners?



How to balance ecosystem services?



National peatlands innovation program

VARIOUS THEMES

Each of the innovation tracks is divided into a number of themes. Themes are developed to fit the specific situation. Some themes result in large programmes, while others are small. Within the four tracks, in 2022 the following themes will be the first to be implemented in living labs:

FOUR THEMES ARE ALREADY UNDERWAY...

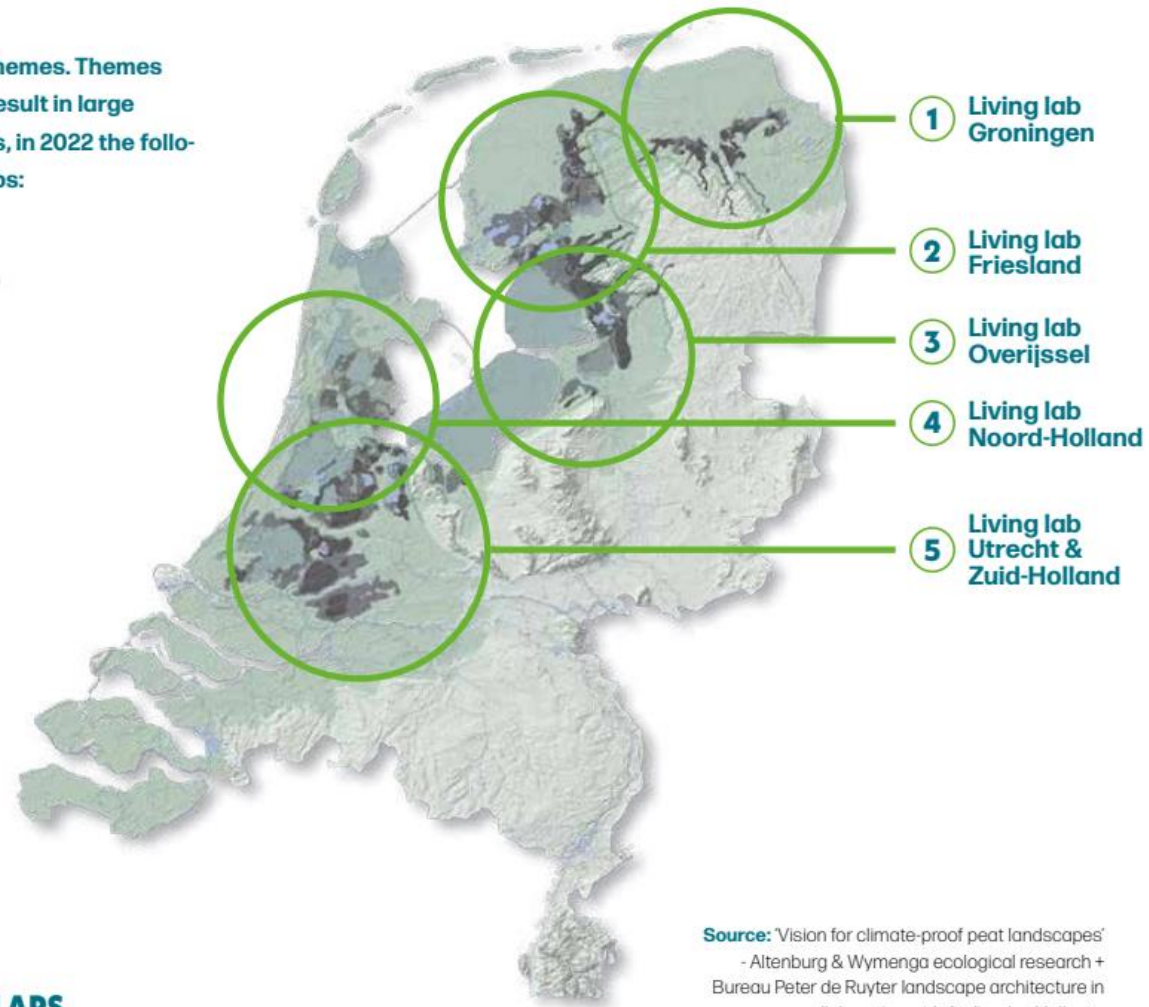
A
CLAY IN PEAT

B
WET CROPS

C
FARMING IN HIGH WATER
TABLE AREAS

D
PEAT MOSS

... IN LIVING LAPS



Source: 'Vision for climate-proof peat landscapes'
- Altenburg & Wymenga ecological research +
Bureau Peter de Ruyter landscape architecture in
collaboration with Atelier des Hollandts.

Thank you!



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