

Facts about peatlands and their cultivation in Finland – importance of peatlands for agriculture

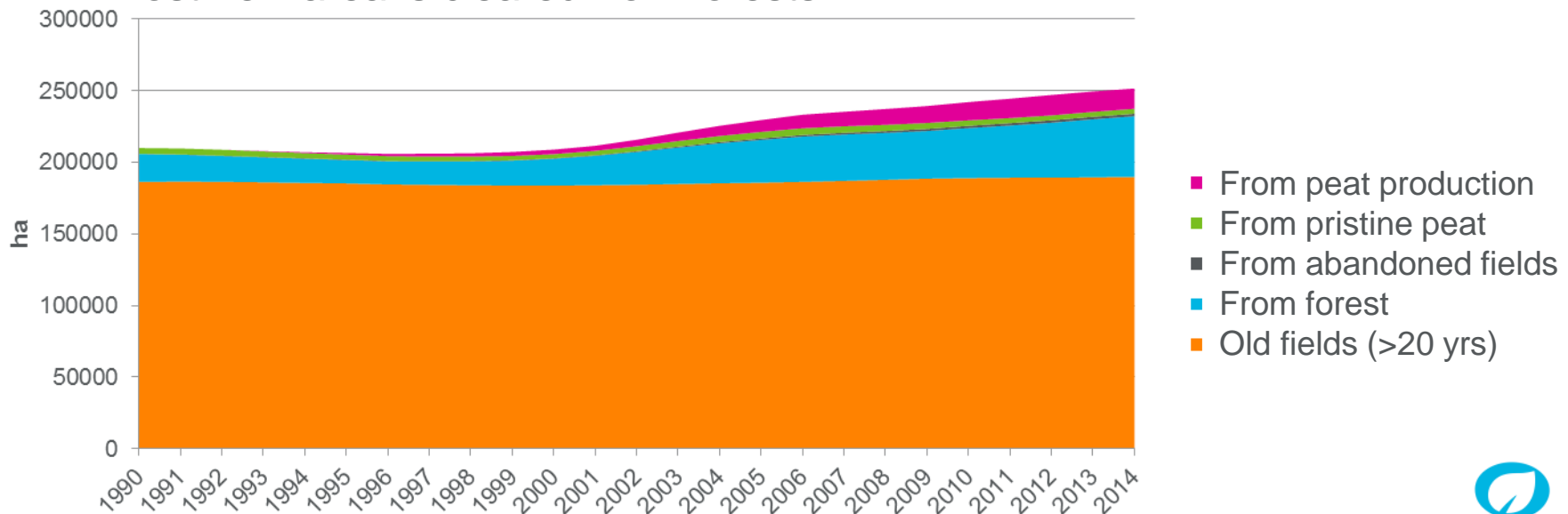
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RESEARCH SEMINAR ON POLICY
INSTRUMENTS GUIDING TOWARDS
SUSTAINABLE USE OF PEATLANDS IN
AGRICULTURE

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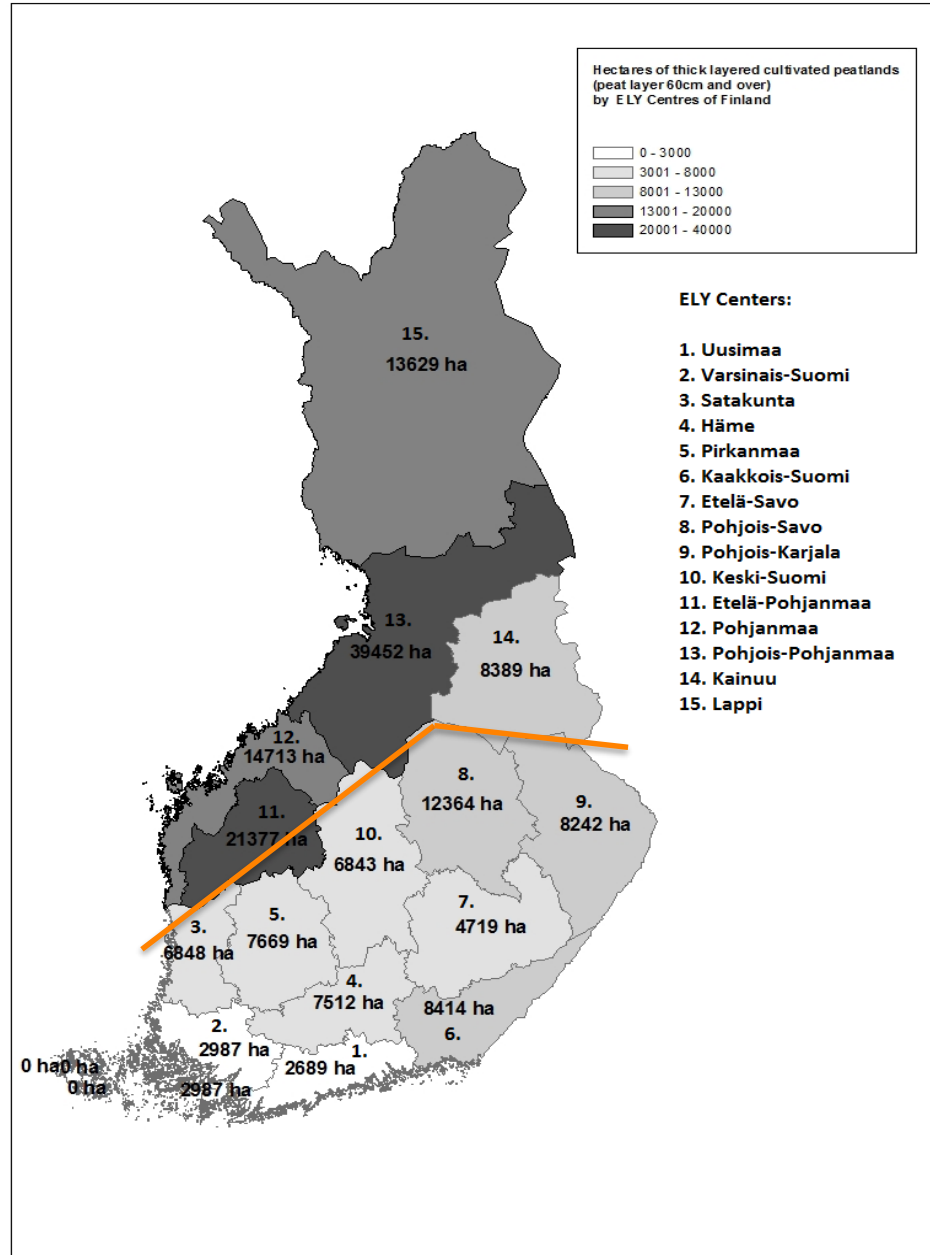
Time series of the area of cultivated organic soils in Finland

- Total area currently 260 000 ha
- The area increased 42700 ha and emissions 1 Mt in 2000-2014
- The increase was 1.5% of the total emissions of Finland
- Total field area or food production did not increase, only farm size increased
- Proportion of peat soils increased 8->11 % 1990-2014
- Most new area is cleared from forests

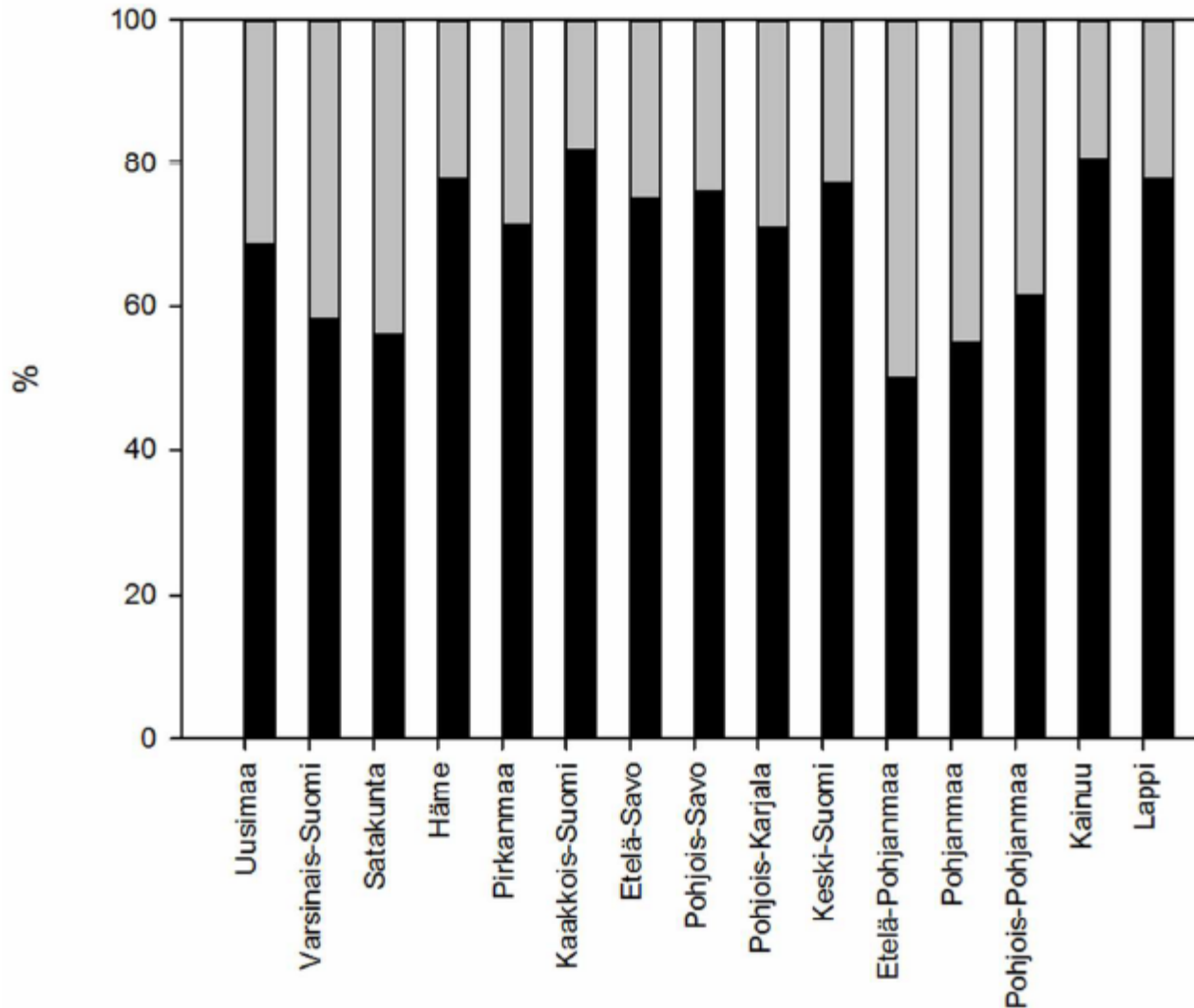


Regional analysis

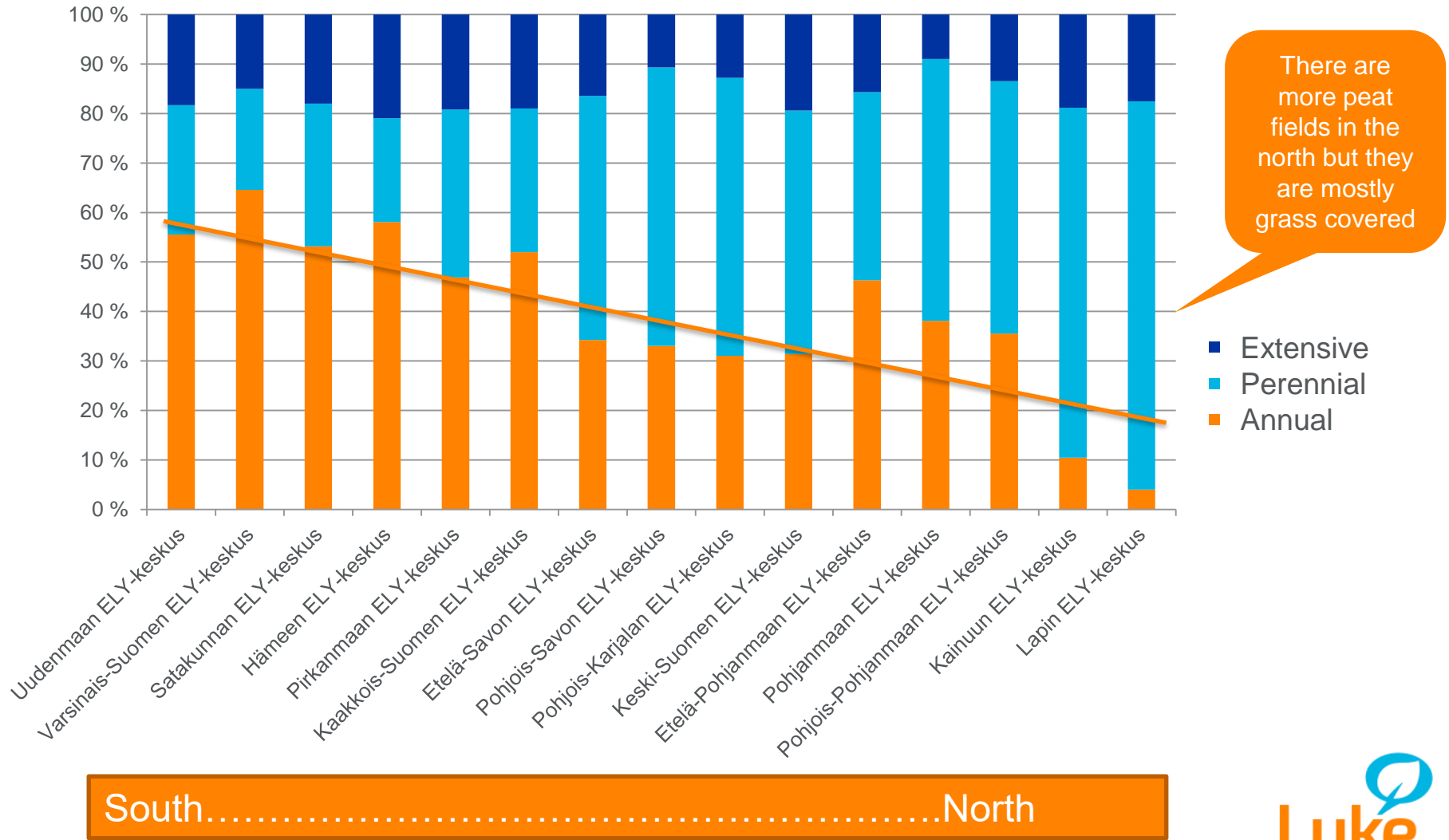
- Question 1: Are all cultivated peat soils necessary for food production?
 - Question 2: Which fields suit best for producing emission reductions?
 - Method: combination of soil database and crop statistics of each field block (2016) → regional division to thin and thick (>60 cm) peat field area and within that to intensive and extensive cultivation
- Finland can be coarsely divided to 2 different regions:
- North: high proportion of peat soils
 - South: lower proportion of peat soils



60 % of cultivated peat soils have peat layer >60 cm

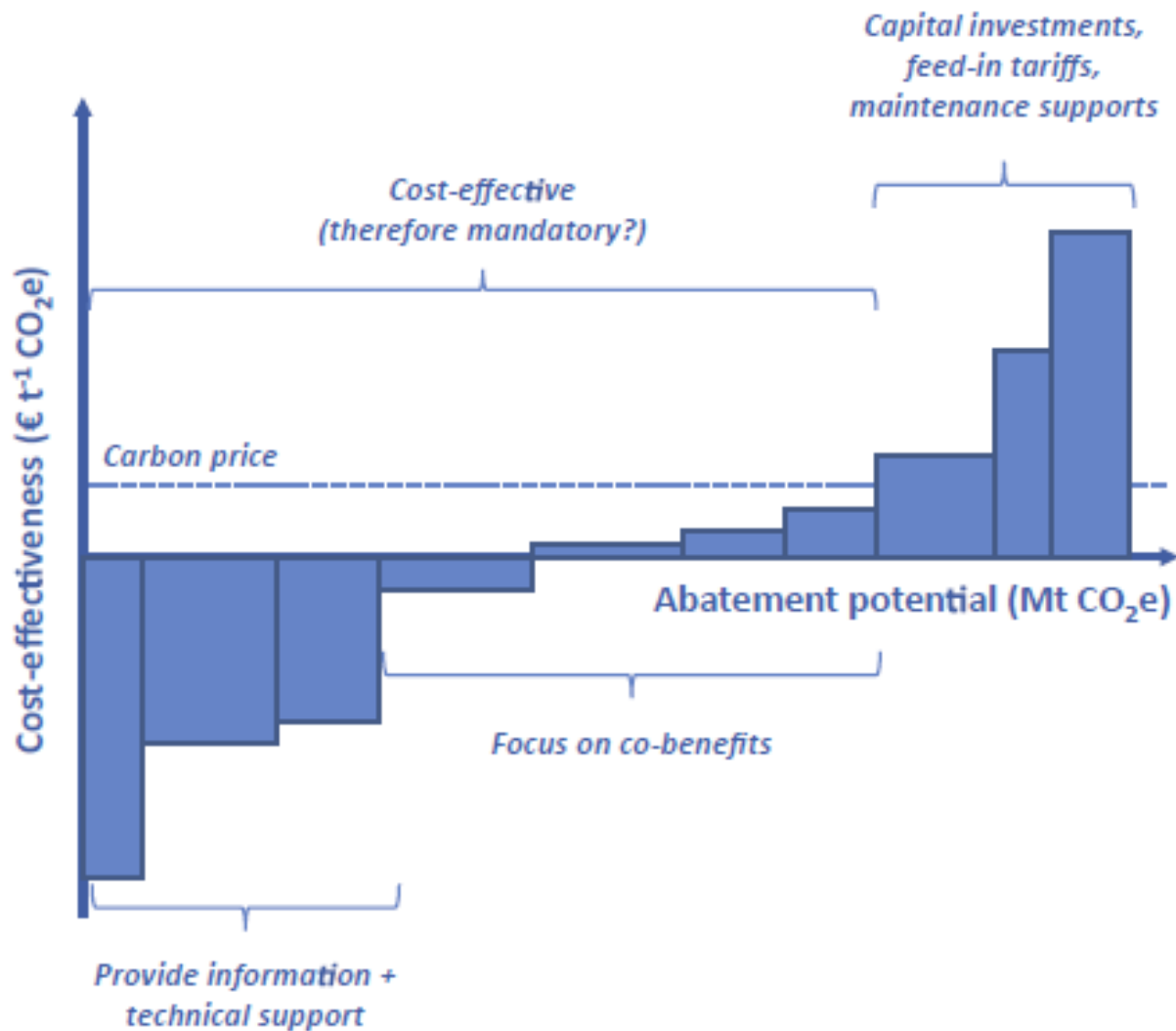


Intensity of cultivation on deep peat soils



South.....

.....North



Classification of GHG abatement measures




Source: Eory et al. 2018.

Eory, V., Pellerin, S., Carmona Garcia, G., Lehtonen, H., Licite, I., Mattila, H., Lund-Sørensen, T., Muldowney, J., Popluga, D., Strandmark, L. & Schulte, R. 2018. Marginal abatement cost curves for agricultural climate policy: state-of-the art, lessons learnt and future potential. *Journal of Cleaner Production* 182: 705-716. DOI:10.1016/j.jclepro.2018.01.252

Fig. 3. Relationship between cost-effectiveness and incentivisation.

What are the feasible scales (1000 ha) of different mitigation measures? A careful bio-physical and socio-economic analysis is needed

Mapping of cultivated organic soils for targeting greenhouse gas mitigation

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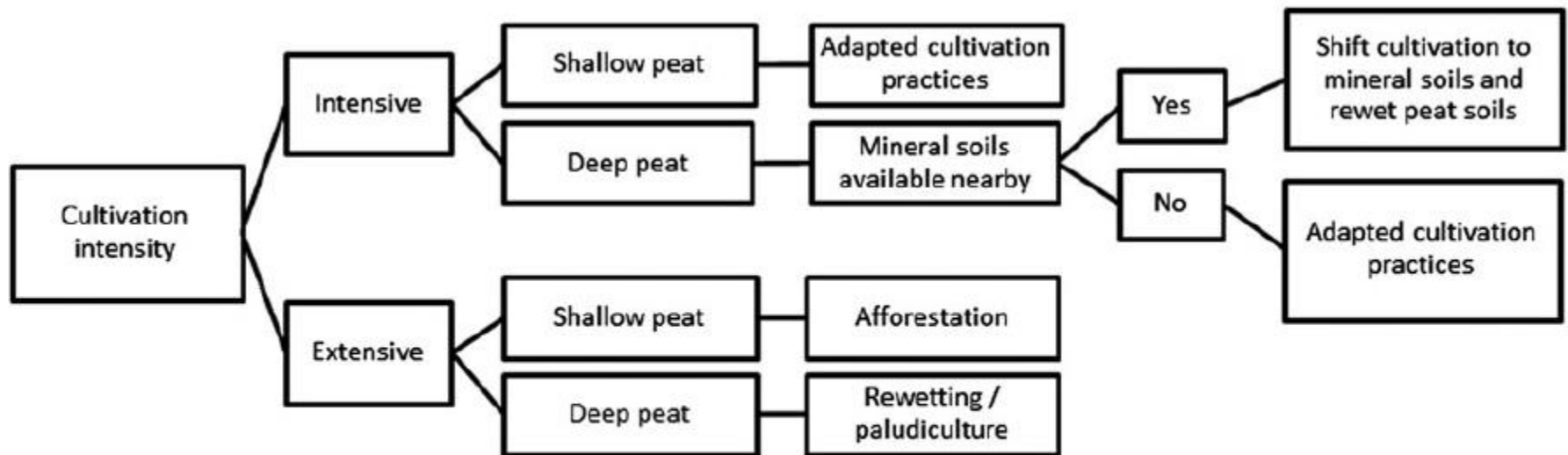
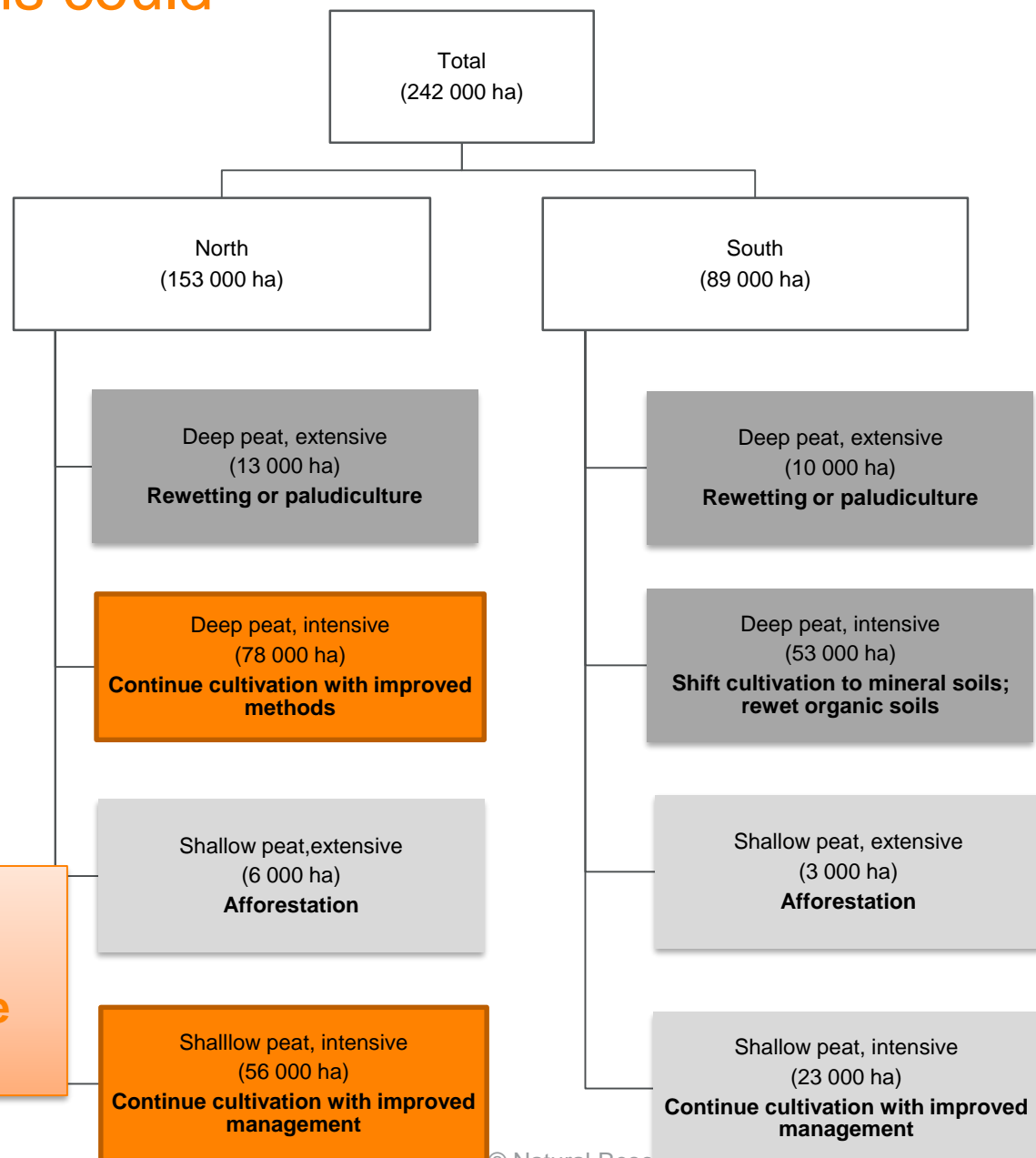


Figure 1. Scheme of the classification of cultivated organic soils. Intensive cultivation includes food and feed production. Extensive cultivation includes temporarily uncultivated fields, biodiversity objects, managed uncultivated field and perennial set-asides. The depth dividing shallow and deep peat is 60 cm.

Mitigation actions could be targeted:

- GHG mitigation on peat soils is easier if there are mineral soils available and if agriculture is not essential for economic viability in the region
- Extensive field is more likely available for mitigation than intensive
- Raising ground water table is most beneficial if the peat layer is deep
- Afforestation suits best fields with thin peat layer as peat decomposition goes on



Result: 134 000 ha are VIP=very important peat soil – can we get rid of the rest?

Mid-term climate plan until 2030

- Climate law of Finland requires a mid-term plan for all non-emission trading sectors
- Planned measures for agriculture are mostly targeted to peat soils:
 - **Perennial cultivation of peat soils**
 - **Afforestation of peat soils**
 - **Silvicultural paludiculture on peat soils**
 - **Raising ground water level with controlled drainage on organic soils**
 - Biogas production
 - Reducing food waste
 - Promoting following the nutritional guidelines
 - **Promoting carbon sequestration and implementation of the 4 per mille initiative**

GHG mitigation of peatlands in the Rural Development Programme

- RDP is the main instrument of mitigation
- Current RDP started in 2015
- A calculation exercise was made to find out which measures are effective, can their effects be reported in the GHG inventory and how should RDP/GHG inventory be developed
- Materials: statistics of the areas under environmental payments
- Methods: GHG inventory methods and literature



Measure	Area ha	Effect t CO ₂ /ha/yr	Method/data sources	Mitigation effect 2015 kt CO ₂ /ha/yr	% of reported CL emission	Comments/Conclusions
Perennial grasses on peat soils	12180	8.07	EFs for annual and perennial crops (IPCC 2013)	99.7	1.5	Payment: 50+54=104 €/ha This is already reported; RDP has increased grass cover of peat soils since 2008. However, the previous land use is not known (whether the perennial grass follows annual cropping or short-term grass).
Controlled drainage in peat soils (both investment and management are paid for)	2233	6.2	IPCC 2013 EF for shallow drainage -40% of EF - >conservative estimate -25%	13.9	0.2	Payments: 250 €/ha for the investment and 70 €/ha/year for management The prerequisite for the payment is raised water table after harvest. However we don't know how the farmers use the facility and what is the GWL.

Thank you!