PEATGOV – Governance Options for Climate Smart Agriculture on Austrian Peatlands

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INTRODUCTION

Peatlands provide a diverse range of ecosystem services, most importantly regulating services including climate regulation via carbon sequestration and storage. They are the most efficient terrestrial ecosystem type for carbon storage. While peatlands cover only 3% of the global land area, they store about 30% of the terrestrial organic carbon pool. Agricultural use of peatlands usually requires lowering the water table via drainage, while the depth of the drainage determines the possible land use and intensity of use. Drainage causes huge greenhouse gas (GHG) emissions and loss of water holding capacity. There are two ways for mitigating GHG emissions from peat soils: avoiding new drainage and reducing emissions on the existing drained area. The former is more easily achieved, while the latter requires a distinctive change of agricultural management on the sites, such as favouring perennial crops, reducing the management intensity, and raising the groundwater level. The realization of mitigation measures on peatland often implies important socioeconomic consequences for affected farms.

OBJECTIVES

Evaluate alternative options for peatland management in Austria, to assess their potential for emission reduction and to identify the most effective governance approaches and policies to support a transformation and adaption towards climate-smart agriculture on peatlands.

WP1
Assessing and **evaluating governance approaches and policies** for climate-smart agriculture in different agricultural contexts in Austria

WP2
Assessing **agricultural land use and management** on peatland sites in Austria. Analysing of **socio-economic aspects and acceptance** of climate-smart management adaptations and policy options in different natural and socioeconomic contexts and for typical farms.

WP3
Assessing the **regional potential for avoiding GHG emissions** by alternative policies and land-management options in different Austrian contexts

WP4
Development of an integrative evaluation matrix: implementation pathways for policy options, management alternatives and potentials for mitigating GHG emissions.

WP5
Regional/local stakeholder workshops

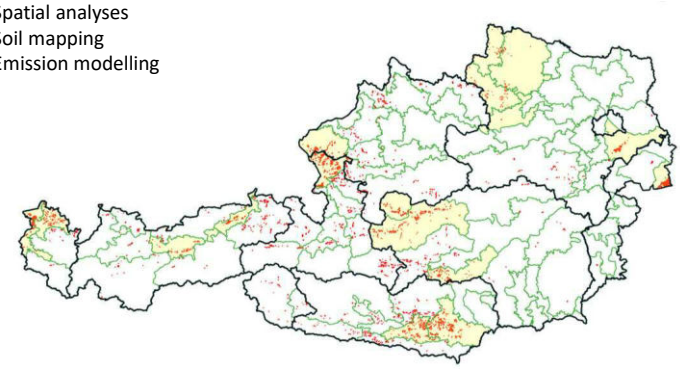
WP6
Assessing realistic potentials for mitigating GHG emissions by climate-smart agriculture in the Austrian context (upscaling)

RESEARCH APPROACH

PeatGov-Austria starts from the three main pillars of the conception of "climate smart agriculture" (CSA), as advocated by the United Nations (cf. FAO 2013, 2017) and the World Bank (2018). Presented by FAO in 2010, CSA aims at contributing to the achievement of sustainable development goals by a) sustainably increasing agricultural productivity and incomes; b) adapting and building resilience to climate change; and c) reducing and/or removing GHG emissions, where possible (FAO 2013).

RESEARCH METHODS
- Literature review
- Analysis of spatial data
- Identification of **case study regions**
- Farmers interviews
- Expert/stakeholder interviews
- Economic cost modelling
- Spatial analyses
- Soil mapping
- Emission modelling

MAIN DATA-SOURCES
- INVEKOS and GIS INVEKOS
- EBOD
- DTM
- HAÖ
- Tbd: LUKAS, JRC soil map, Hydro



FIRST RESULTS

Sources of financing and policy instruments

Sources of financing	Instruments	Example
Governmental funds (EU and /or national)	- European Agriculture Fund for Rural Development - European Regional Develop-ment Fund - National payment schemes	- Co-financing the 2nd Pillar of EU CAP, e.g. peatland restoration, habitat management - Climate mitigation by peatland rewetting (round tables, pilot projects, research) - Restoration, habitat management
Compulsory measures or payments (costs-by-cause)	- Biodiversity offsetting - Taxes, levies, charges	- Compensation allowances for building or mining activities used for peatland rewetting - Water withdrawal fee used for peatland rewetting to improve water quality
Voluntary payments (allowing for private sector/ persons investment)	- Voluntary markets for ESS - Sponsorship, donation - Fees for recreation	- MoorFutures (Germany), UK Peatland Code - NGOs collecting money for restoration - Entrance fee, hunting licence

Different types and intensities of agricultural land use and management on peatland sites in Austria

Alps: predominantly grassland; forage for dairy cattle
Kärtner Becken: predominantly arable land; forage production
Seewinkel: heterogeneous use (field sizes/crop rotation); no animal husbandry

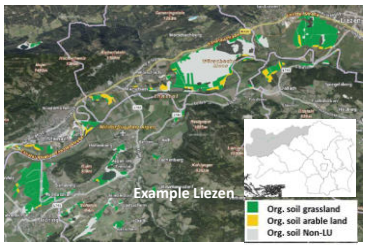
Agriculture on peatland	Alps	Kärntner Becken	Seewinkel
farm size (mean)	20,12 ha	19,86 ha	**44,68 ha**
farm types	**75% forage farming** 7% crop farming 3% mixed	**34% forage farming** **21% crop farming** 15% mixed	**49% crop farming** **30% permanent cropping** 13% mixed
field size (mean)	1,42 ha	1,58 ha	**2,74 ha**
land use	**71% meadow/pasture (≥3 uses)** 11% meadow/pasture (2 uses) 6% bedding meadow	**25% grain corn** 14% meadow/pasture (≥3 uses) 10% alternating (grass-/cropland)	**21% winter wheat** **20% alternating** (grass-/cropland) 10% grain corn
livestock density	1,28 LU/ha	1,02 LU/ha	0,03 LU/ha
livestock (...% of all farms keep)	**77% cattle** (incl. 51% dairy cows) 49% poultry	**49% cattle** (incl. 15% dairy cows) 47% poultry 37% pigs	**negligible**

The spatial pattern of land use, including ownership and the share of peatland in the total area of a farm, has a strong influence on the feasibility of rewetting

Structure of field & land use (same scale; same colour = same use)

Assessment rules for available soil and environmental data

- Hierarchical order for use of input-data:
  - large resolution will be preferred to small resolution
  - Field measurements will be preferred to remote sensing
- Meta information requirements: description of measurement unit, extent, resolution, measurement period
- Translation of Austrian soil classes to world reference base (WRB) classes in order to accomplish international comparability



Liezen (Styria)	total area ha	organic soil ha	organic soil %	share of AT soil classes Anmoor	share of AT soil classes Moor
Grassland	89174	2491	3%	41%	59%
Arable land	1025	133	13%	62%	38%

Tab. 2: Soil classes: Moor, Anmoor (ebod, BFW, 2010)) for arable and grassland (Feldbodenstücke, AMA, 2019)

Classifications	Österr. Bodensystematik	WRB (World reference base for soil resources 2014)
Key-Class	Moore und Anmoore	Histosol
Thickness of soil organic layer	>= 30cm	> =10 cm from soil surface OR >= 60 cm, if 75 vol.% are moss fibres or >= 40 cm for other materials
Amount of organic Material	Moore >= 35% SOM , Anmoor between 10% and 35% SOM	if thickness < 20cm: >= 12% SOC in the first 20cm of soil.

Tab. 1: Differences in the classifications of the Austrian soil classification and the world reference base (WRB)

NEXT STEPS