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Towards climate-friendly agriculture on peatlands – insights from Austria

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Introduction

While natural peatlands under wet conditions are CO_2-sinks, they turn into strong sources of CO_2 when drained and being used intensively for agriculture (Joosten 2012). With the rewetting of peatlands and the introduction of paludiculture as potential measures under the so-called Eco-Schemes (EC 2021), and especially with the introduction of a new conditionality, namely GAEC 2 (Good Agricultural and Environmental Conditions) (BMRLT 2021a), the emissions from agriculturally used peatlands and their reduction is now finding their way into the CAP. While in Ireland a peatland strategy was already published in 2015 (DAHG 2015) and peatlands are addressed for example in the project FarmPEAT (Irish Rural Link 2022), in Austria, a national peatland strategy was only recently published, also including agriculturally used peat soils (BMRLT 2021b). At the same time, it is still not known to what extent peatlands are drained and used agriculturally in Austria and thus, also the structure of use and the farms managing these areas are unknown. Our study aims to close this knowledge gap and, furthermore, to shed light on socio-economic effects of possible measures for a more sustainable management on peatlands for farmers.

Data and research methodology

In order to estimate the extent of drained peatlands and their structure of use, the digital soil map of Austria (BFW 2020), providing information on soil types including peat soils, is intersected with spatial IACS data (BMRLT 2021). For the area of agriculturally used peatlands thereby identified, farm level IACS data are processed to analyse the structure and types of agricultural use. Moreover, by means of a literature analysis, socio-economic factors influencing agriculture on peatlands are identified. Based on these factors and the IACS data,

a cluster analysis is carried out to provide information on the structure of farms managing peatlands.

Triangulating the results of these analyses, three different case study regions in Austria were selected. They reflect typical context situations of agricultural use on peatlands including the respective farming systems. In these regions, expert interviews and interviews with farmers are carried out as a part of the case study analyses, providing information on socio-economic context factors that cannot be derived from available secondary data. Based on these primary data and IACS data, economic models are developed to estimate socio-economic effects of possible measures for a more sustainable management on peatlands for farmers on farm and field level.

(**Expected) results and discussion**

First results show, that in Austria around 79.300 hectares (ha) of agricultural land (excluding alpine pastures), are completely or at least partially located on peat soils, which accounts for about 2,5% of the total UAA. 61,3% of the 79.300 ha are managed as grassland, mostly intensive with three or more uses per year, and 38,2% are managed as arable land. Correspondingly, the cluster analysis shows that about 75% of all farms managing peatlands and about 65% of all agriculturally used peatlands can be attributed to grassland farms, with specialised dairy farming being especially important (about 40% of all farms). 35% of the peatlands are cultivated by arable farms, with or without livestock. Regarding the three case study regions, three different context situations of agricultural peatland management can be described, and potentials for a transition towards more climate-friendly management can be derived:

Specialised dairy farms predominate on agriculturally used peatlands in the Salzburg region. Land is cultivated predominantly as intensively used grassland with three or more uses per year. It is likely that forage losses caused by potential rewetting or extensification measures can hardly be replaced and farmers are limited in their flexibility to adapt due to the capital-intensive farming system (Schaller 2014; Röder and Grützmacher 2012). Correspondingly, expert interviews revealed that regular drainage of the land and its cost-benefit is not questioned by the farmers as peatlands are fully integrated into their farming system. This is

supported by that fact that, according to the experts, only few differences between peat soils and mineral soils can be found regarding management and productivity. Initial results from economic calculations also show, that the value added for farmers by the use of peatlands is high.

Also, in the 2nd case study region in Vorarlberg grassland farms are predominant. However, extensively used litter meadows and more extensive forms of livestock farming are also present as managed peatlands are partly located in Natura2000 areas. Arising from the valley situation and an ongoing urbanisation process, the pressure on agricultural land in the region is strong. Due to their status as Natura2000 sites, peatlands have thus become a "refuge" for agriculture and are correspondingly important for farmers. The direct neighbourhood of arable land to extensive litter meadows is also special in the region and could bear conflict potential when enhancing water levels on the extensive land leads to spill-over effects on the intensive fields (Schaller 2014).

In the 3rd case study region in Carinthia, arable farming predominates, with and without animal production. On arable area, corn takes the most important share of the crop rotation, being processed through animal production (e.g. pig fattening). Generally, feedstock from arable land is easier to replace than roughage from grassland, as it can normally be purchased from the market (Schaller 2014). However, according to experts, especially pig farms in the region are competitive mainly due to their potential to produce own feedstock and hereby particularly corn with its high yields. From the expert's perspective, farms would clearly be less profitable due to high market prices for pig concentrate feed, in case arable forage area was lost due to peatland extensification.

Conclusions and Outlook

Introducing climate-friendly management on peatlands is associated with consequences for farms, which depend on the socio-economic characteristics of affected farms. Agriculturally used peatlands in Austria are largely used for the production of fodder in different farming systems. About 80% of the farms keep more than one livestock unit per hectare and are therefore dependent on the land to feed their animals. Especially roughage can hardly be replaced. While studies from Germany suggest that arable farms could replace lost fodder

more easily (Schaller 2014, Angenendt et al. 2014), this applies to Austria only in a limited extent. The example of Carinthia shows that profitability of pig farms in Austria seems to be driven by the fact that they produce own feedstock.

However, with about 80.000 hectares of agricultural land on peat soils, resulting emissions in Austria are significant. First results of this study show that the implementation of emission-reducing measures is likely to be associated with significant disadvantages for farmers. Possible measures to reduce emissions on these areas must therefore be discussed considering the costs incurred by farmers and their attitude towards possible alternatives and compensatory measures.

Based on the findings, in early 2022 farm surveys of typical farms will be carried out in the three case study regions. The results of these surveys are expected in April, including economic key figures on the productivity of the peat soils and the effects of possible measures. This analysis can also draw on experience from other countries, e.g. Ireland, where measures and projects for a more sustainable management of peatlands have already been initiated.

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