



Climate-friendly peatland management in Germany: stakeholder participation and microeconomic analysis

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Summary

German peatlands are often used intensively for agriculture. Since climate-friendly peatland management demands less land use intensity, a decrease in agricultural income is to be expected. In this regard the potential to re-organise the use of peatlands is analysed. As socio-economic conditions vary significantly throughout Germany, the study takes place in six sample regions. To measure local diversity, stakeholder workshops as well as farm surveys are realised. First results indicate the prospects for adaptation and development of agricultural land use and, as a result, the potential to re-organise land use in a more climate-friendly way varies significantly due to variation in conditions between different regions.

Key index words: Agricultural use of peatlands, climate effects of peatland use, stakeholder participation, farm surveys

Introduction

Agricultural use of peatland has a negative impact on the German greenhouse gas balance. Cultivation of peatland demands a water-level drawdown that causes aerobic degradation of peat soils. This results in the loss of the peatlands' function as carbon sinks, as well as the emission of carbon dioxide (CO₂) and nitrous oxide (N₂O). Currently more than 80% of German peatland is used agriculturally. This causes anthropogenic greenhouse gas emissions of 2.3 – 4.5% of the overall German emission. (Byrne *et al.*, 2004)

Intensive peatland management is predominantly carried out as arable land and intensive grassland. Particularly arable land on sites with low groundwater tables is considered to be climate affective. In contrast, the conversion of arable land to grassland, the decrease in land use intensity and the reestablishment of the original groundwater table appear to be up to standard with climate-friendly peatland management. (c.f. Drosler *et al.*, 2008) However, the decrease in land use intensity implicates a reduction in both agricultural yield and income. Severe economic consequences are to be expected. This presentation analyses current potential to re-organise the agricultural use of German peatlands, as well as the effects of

climate-friendly peatland management on the microeconomic situation of affected farms. It is assumed that the potential to reduce land use intensity is highly dependent on local basic conditions. (c.f. Vogel, 2002; Kantelhardt and Hoffmann, 2001) Since basic conditions in Germany, such as economic and agro-political frameworks or local site specifics, vary to a large extent, the study takes place in six sample regions that include all typical natural and socio-economic conditions of peatland use.

Materials and methods

Data acquisition

The diversity of local conditions is examined by applying three instruments of data acquisition: first, data analysis of official statistical data, second, stakeholder participation and third, local farm surveys.

Statistical data were collected at both administrative district and municipal level. Statistical data research was principally carried out on four topics: 'Structure and socio-economy of local agriculture', 'Local land use', 'Local change in agricultural structure' and 'Local agricultural harvests'. Data were recorded using the official statistics of the Statistische Bundesamt Deutschland (German Federal Statistical Office).



Stakeholder participation attempts to identify the retardant and promotional factors of an implementation of measures for climate-friendly peatland management. Therefore the interests and expertise of local stakeholders are to be incorporated. In this context workshops were held in all regions, integrating all local stakeholders of relevance. Stakeholders representing the fields of agriculture, water supply and distribution, strategic planning, regional development, nature and peatland conservation, local authority, administration and tourism as well as locally relevant groups (e.g. hunting, forestry, fishery, etc.) were involved. One objective of the workshops was to inform the stakeholders about the contents and objectives of the study. On the part of the stakeholders, the interests, prospects of development and difficulties and requirements concerning local peatland management were expressed and discussed.

Discussion was focused on the topics a) local conditions, b) competitive relations between different groups of stakeholders and c) local prospects of climate-friendly peatland management.

Current extensive *farm surveys* are compiled in all sample regions. Their results will be used additionally as the basis for the analysis and evaluation of microeconomic effects. Per region 15 to 20 farms are involved. The inquiry is arranged and conducted by local experts. The questioning technique is defined as follows: a) the survey is carried out in the form of personal interviews with the farm owner or manager, b) in order to avoid falsification through the influence of different interviewers, the interviews follow a structured, pretested questionnaire, wherein questions are kept in closed form, offering standardised answers, and c) data concerning the land use of the farm's peatland is additionally described on the basis of a detailed geographic map. The questionnaire covers the topics of farm organisation and equipment, livestock husbandry, crop and grassland cultivation processes on peat soils, water management and site conditions, the prospects of climate-friendly use of farm peatland and the prospects of regional development. Local experts were consulted to identify potential farms. Selected farms had to meet three main selection criteria. First, the selected farms have to *cultivate peatland* in the test region. Second, the *farm organisation* must be considered either typical in the region concerning the farm's socio-economy, size and orientation or specially adapted to the situation of peatland cultivation by specialisation (niche production). Third, only farms could be selected, whose manager expressed the *willingness to co-operation* and agreed to participate in the interviews and provide farm management data.

Regions of study

Conditions are analysed within six German regions. In each case *two* sample regions are located in Lower Saxony and Bavaria respectively, while in each case *one* region is located in Brandenburg and Mecklenburg-Western Pomerania. The sites cover the range of existing peatland types as well as the range of management and cultivation types. The chosen sites vary from regions with very low (maintenance of peatland area/ husbandry of suckler cows), up to very high degrees of agricultural intensity (intensive dairy cow husbandry, pig and cattle fattening, intensive poultry management).

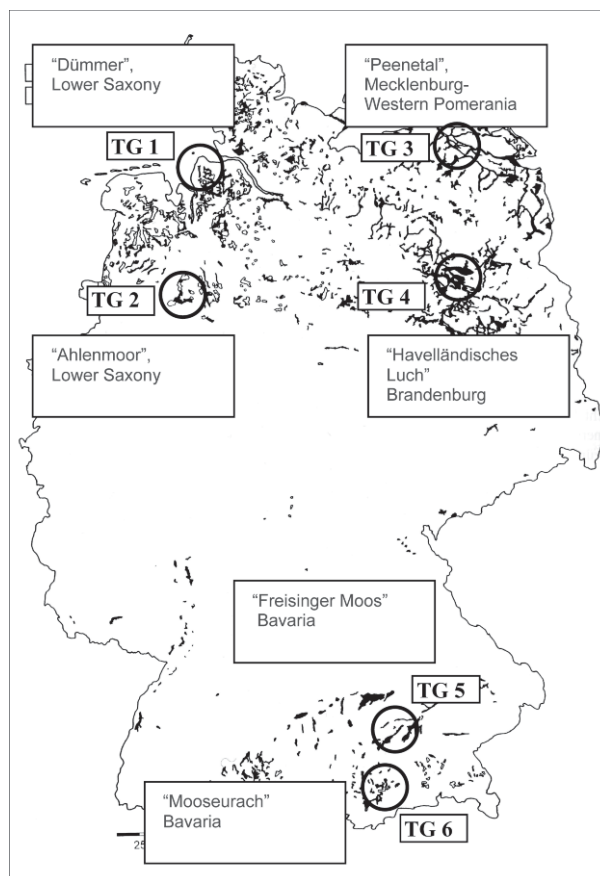


Figure 1. Location of the sample regions (modified from Pfadenhauer and Droesler, 2005)

Results

First results of the workshops confirm the thesis that prospects of adaptation and potential for the development of agricultural land use vary significantly throughout the different regions and have an important influence on the perspectives of climate-friendly peatland management. It was observed that different factors determine the potential to implement measures for peatland conservation. Among other factors, such as natural finiteness of agricultural usability of peat soils, options of adaptation, required compensations, standard of knowledge, etc., three particular factors were identified as having a high impact. First, the technical feasibility of restoration and water logging, second, the level of agricultural profitability of peatland cultivation concerning income and capital commitment, and third, the existing level of interconnection and co-operation between local stakeholders.

Technical feasibility of regeneration and water logging:

Climate friendly peatland management implies the raising of the water table (Pfadenhauer and Droesler, 2005). As the workshops clearly showed, technical feasibility and resulting costs concerning this matter differ throughout the sample regions. As an example, prospects of restoration and water logging in the region in Brandenburg are highly limited by the low average rainfall and the resulting lack of water. In addition, the significant degradation of the peatland soils



in this region strongly affects its function for water storage. Even if calibration of the water tables could be managed in this region, technical water logging is likely to turn out to be costly. In contrast, in the sample region in Mecklenburg-Western Pomerania, the analysed peatland area is located within a river valley. For this site technical implementation of water logging does not pose a problem. The acreage in the river valley can be described first and foremost as grassland polders of marginal gains. Since the ground surface lies below the natural water table, the water has to be actively pumped out of the polders. Water logging can be done by slitting the banks surrounding the acreage. After implementation of the measures, further regulations to keep the high water table are not necessary, hence further consequential costs appear to be low.

Level of agricultural profitability of peatland cultivation

Another result of the workshop was awareness of the fact that the intensity of agricultural use of peatland throughout Germany also differs greatly. Thus, for example, the peatland areas of the two Lower Saxony regions are used in a highly intensive way. The 'Dümmer' fen region can be classified as a pronounced region of tillage and high-grade animal production in terms of pig and cattle fattening. The 'Ablenmoor' bog region is a highly productive grassland site used for dairy cattle husbandry. Although in both regions the technical potential for restoration and water logging is to be considered good, the prospects for climate-friendly peatland management do not apply, as the use of the peatland area is essential for the generation of local agricultural income. In the 'Dümmer' region, maintenance of agricultural income first and foremost depends on keeping up and even increasing the high number of animal units in the region. Peatland area is indispensable on the one hand for the production of forage on arable land, on the other hand for compliance with the conditions of the German Fertiliser Ordinance. In the 'Ablenmoor' region, grassland site conditions limit agriculture to high-grade animal production. From the perspective of the agricultural stakeholders, dairy cattle husbandry is considered to be the optimal way to utilise the local agricultural potential. Because of the high capital commitment of the investment-intensive husbandry of dairy cattle, farmers' flexibility towards alternative land use is limited. In the 'Moosurach' region in Bavaria, where peatland area is also used mainly for dairy cattle - although less intensively - the high level of capital investment can be assumed as the main barrier for the acceptance of climate-friendly peatland management. In contrast, income aspects in the peatland area of the two sample regions, 'Freisinger Moos' and 'Peenetal', do not present a significant obstacle to alternative use of peatland. While the Bavarian 'Freisinger Moos' region experiences a voluntary pullback of agricultural use, as local agriculture diminishes in general, and the cultivation of the small structured area is not profitable anymore, in the 'Peenetal' region acreage is given up, as the high costs of keeping the grassland polders under cultivation tend to exceed the benefits.

Level of interconnection and co-operation

The standard of interconnection and co-operation between local stakeholders was identified as a major criterion for the implementation of conservation measures. The prospects of changes in land use are to be considered comparatively good for regions where local stakeholders are connected within a tight and active network system.

It also became apparent that allowances for conservational peatland management were particularly made if the level of awareness concerning the peatlands value, for the conservation of water, biodiversity, climate etc., and the standard of knowledge about the degradation of agriculturally used peat soils and the finiteness of long-term peatland cultivation was substantial. In 'networking' regions, all stakeholders' level of information concerning these matters and the level of discussion of competing interests and requirements was seen to be remarkably high. In effective network systems stakeholders that provide scientific information are involved, as are stakeholders that are capable of planning and implementing development concepts that still involve the needs of all affected groups. In contrast, the development and implementation of measures in regions that lack existing interconnections between local stakeholders are likely to find low acceptance.

The Bavarian 'Freisinger Moos' is an example of a pronounced networking region. Here an active stakeholders' network exists in terms of a local LEADER+ project for regional development. Within this region the groups' co-operation and standard of knowledge enhances the level of acceptance concerning conservation measures to a high extent.

Discussion and conclusion

The results of the workshops show that the prospects of climate-friendly peatland management vary significantly throughout German peatland regions due to different impact factors.

Technical feasibility obstructs the implementation of measures in the different regions. Adaptation to conservation measures in peatland regions under intensive agricultural cultivation is likely to cause severe economic costs that have to be compensated. In peatland regions where agricultural value-added is provided by animal husbandry, change of land use management is likely to be limited. The options for adapting to conservation measures are hindered for investment-intensive production on peatland sites in particular. Although technical feasibility and the agricultural profitability of local peatland cultivation significantly influence the costs of climate-friendly peatland management, the acceptance of the implementation of conservation measures will mainly depend on the level of compensation on the one side and on the level of information, interconnection and co-operation between local stakeholders on the other. Provided that options for regional development are promoted by an efficient network of local stakeholders, measures for climate-friendly peatland management can be developed and implemented more effectively.



The first results of the workshops reveal that, in the further course of the study, importance must be attached to the analysis of the existence and intensity of local network systems. Furthermore, economic effects of potential measures towards climate-friendly peatland management must be analysed and quantified. The current disposition of local agriculture to participate in peatland conservation activities must be examined and the factors influencing the level of willingness to participation must be identified.

Therefore intensive network analysis in the sample regions will take place in the near future. Upon completion of the farm survey, results will be interpreted and used for the analysis and evaluation of microeconomic effects. A model will be built to describe the effects and costs of climate-friendly peatland management scenarios.

Acknowledgements

Work has been granted by the Federal Ministry of Education and Research (FKZ 01LS05047)

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