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Climate change mitigation with waterbuffalos

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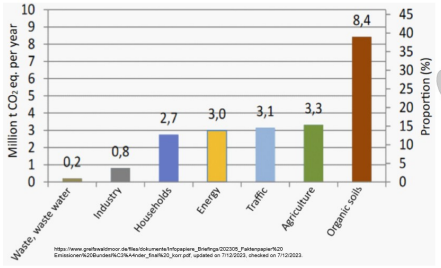
1. Emissions
Peatlands and Livestock

"Peatlands occupy only 3% of the world's land area, but contain twice as much carbon in their peat [...] as the total biomass of all the world's forests." (Joosten 2009).

Emissions from peatlands in Mecklenburg-Western Pomerania



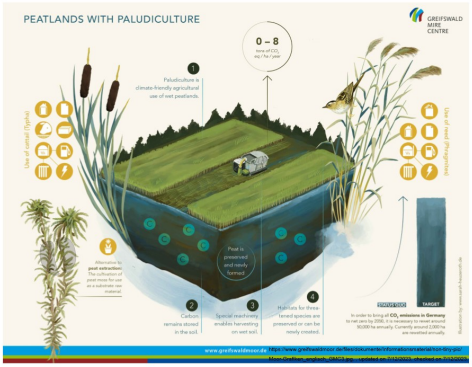
In a federal state rich in peatlands such as Mecklenburg-Western Pomerania, drained peatlands are the largest single source of greenhouse gases. (1).

69.5% of agricultural emissions came from animal husbandry alone in 2022, representing **5.2%** of Germany's total emissions.

In 2022, around 38.6 million t CO2-equivalent GHG emissions were attributable to direct livestock farming alone (2).

Water levels and climatic effect on peat consumption or peat conservation in used peatlands

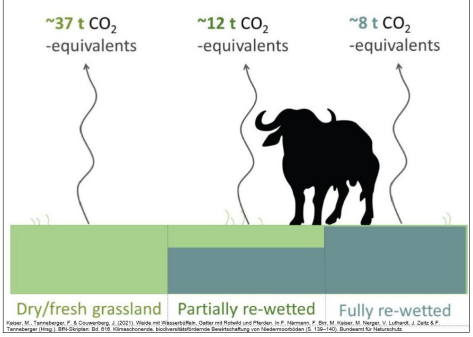
2. Mitigation
Waterbuffalo grazing



Paludiculture is a method of wet management of peatlands with peat conservation or peat formation. (3)

„In every [re-wetting] scenario the site emissions [on buffalo pastures] are lower compared to management procedures on drained grassland." (Kaiser et al., 2021)

The wetter the grasland, the lower the emissions.



3. Implementation
Climate Farming

Mire climate farmers

I provide climate protection services by cultivating my wet peatlands with i.e. water buffalos, because like that I reduce greenhouse gas emissions (4).

I need recognition for this and require economic incentives that make it attractive to shift to paludiculture and make it economically viable for my farm (4).

Husbandry conditions of Water buffalos: Advantages and Challenges for farmers.

Advantages	Challenges
Broad nutritional spectrum Fodder and water requirements similar to cattle High fodder conversion	Supplemental feeding in winter
Winter resistant (-20°C with dry conditions)	Susceptible to heat stress Need for wallows
Adaptable to environment	Conflict between re-wetting and minimum requirements for firm ground
Low costs of use	High factor costs
Established practice in landscape conservation and maintanence	

Sambraus, D.-P. (2005), Sweers, W. et al. 2013, Sweers, W. et al. 2014, Spindler, B. (2010), Müller, J. & Sweers, W. (2018).

EU Funding Framework

Currently, EU agricultural policy is perverted with respect to peatlands: Direct payments incentivize drainage-based intensive land use rather than restoration.
Water buffalo are a wet land use option that is already subsidized, unlike other paludiculture (5).

"Buffalo grazing [...] combines positive effects of ecological stock management with economically viable meat production, assuming an effective grazing and herd management." (vgl. Sweers, Kanswohl & Müller, 2013)

https://www.greifswaldmoor.de/files/dokumente/GMC%20Schriften/2022-05_Nordt%20et%20al_Paludikultur%20Leitfaden.pdf, updated on 7/12/2023, checked on 7/12/2023.

References:
Joosten, H. (2009): The Global Peatland CO2 Picture. Peatland status and emissions in all countries of the World. Wetlands International, Ede. 10.5. (PDF)
(1)Hirschelmann, S., Tannebergerr, F., Wichmann, S., Reichelt, F., Hohlbein, M., Couwenberg, J., Busse, S., Schröder, C. & Nordt, A. (2022) Moore in Mecklenburg-Vorpommern im Kontext nationaler und internationaler Klimaschutzziele - Zustand und Entwicklungspotenzial, Faktensammlung. Greifswald Moor Centrum-Schriftenreihe 03/2020 (Selbstverlag, ISSN 2627-910X), 36 S.
(2)Umweltbundesamt (2023): Beitrag der Landwirtschaft zu den Treibhausgas-Emissionen. Available online at https://www.umweltbundesamt.de/daten/land-forstwirtschaft/beitrag-der-landwirtschaft-zu-den-treibhausgasemissionen-aus-der-landwirtschaft, updated on 7/12/2023, checked on 7/12/2023.
(3)BFN https://www.bfn.de/paludikultur, updated on 7/11/2023, checked on 7/11/2023.
Kaiser, M., Tannebergerr, F. & Couwenberg, J. (2021): Wälde mit Wasserstoffen. Getter mit Rotwild und Pferden. In F. Närmann, F. Birr, M. Kaiser, M. Nerger, V. Luthardt, J. Zeitz & F. Tannebergerr (Hrsg.), BfN-Skripten. Bd. 618. Klimaschonende, biodiversitätsfördernde Bewirtschaftung von Niedermoorböden (S. 139-140). Bundesamt für Naturschutz.
(4) https://www.greifswaldmoor.de/aktuelles/was-ist-ein-moor-klimaexit.html, updated on 7/12/2023, checked on 7/12/2023.
(5) Sweers, W., Kanswohl, N. & Müller, J. (2013): Zur landschaftspflegerischen Eignung des Wasserbüffels (Bubalus bubalis). Züchtungskunde, 85(6), 462-478. Sweers, W., Mähring, T. & Müller, J. (2014). The economics of water buffalo (Bubalus bubalis) breeding, rearing and direct marketing. Archives Animal Breeding. 57(1), 1–11. https://doi.org/10.7482/0003-9438-57-022. Spindler, B. (2010). Wasserbüffelhaltung. https://www.lfzt.de/fileadmin/user_upload/Artikel/Tierhaltung/Andere_Tiere/Wasserbueffel/Wasserbueffelhaltung.pdf Müller, J. & Sweers, W. (2018). Produktion von Futter in Paludikultur. In W. Wichtmann, C. Schröder & H. Joosten (Hrsg.), Paludikultur - Bewirtschaftung nasser Moore. Klimaschutz Biodiversität regionale Wertschöpfung (S. 58-63). Schweizerbart
(6) Wichtmann, S. (2018). Economic incentives for climate smart agriculture on peatlands in the EU. Proceedings of the Greifswald Mire Centre,1. 2018.
Sweers, W., Kanswohl, N. & Müller, J. (2013): Zur landschaftspflegerischen Eignung des Wasserbüffels (Bubalus bubalis). Züchtungskunde, 85(6), 462-478.