# Master Thesis: Paddy rice as a climate-smart solution for the agricultural use of degraded peatlands?

## Background

**Historically, many peatlands in Switzerland were drained for agricultural use. The drainage of these originally wet soils induces mineralization of the peat material, leading to high greenhouse gas (GHG) emissions. However, cultivation of crops on these fertile soils is very profitable. By rewetting these soils, GHG emissions can be considerably reduced, but conventional agriculture is no longer possible. One possible option to solve this problem is to rewet these soils and cultivate wet-adapted plants, so-called "Paludiculture". Since a few years, paddy rice is grown in Switzerland (Jacot et al 2018), with positive impacts on biodiversity (Gramlich et al. 2020). The effect of paddy rice cultivation on GHG emissions in the temperate zone is however less clear.**


## Aim

**We aim to explore the different management options of paddy rice to maximize yield whilst minimizing GHG emissions. At Agroscope Reckenholz, a mesocosm unit (picture above right) allows us to study the effect of water table depth and soil properties on GHG emissions of rice and grass (as a comparison) cultivation. The GHG emissions ($CH_4$, $N_2O$, $CO_2$) are measured with manual chambers.**

## Methods

- **Measurement of GHGs ($CH_4$, $N_2O$, possibly $CO_2$) in the mesocosm unit with manual chambers**
- **Data analysis using R**

**Time**: **Starting date: Spring 2023**
**Duration:** **9 months (with fieldwork May–September 2023, part-time)**
**Location:** **Agroscope Reckenholz in Zürich Affoltern**
**Contact:** **PD. Dr Jens Leifeld**
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Jacot, K., Churko, G., Burri, M., and Walter, T. (2018). Reisanabau im Mittelland auf temporär gefluteter Fläche möglich. Agroscope Transfer 238, 7

Gramlich A., Churko G., Jacot-Ammann K., Walter T. (2020) Biodiversität auf Nassreisfeldern im Schweizer Mittelland: Gefährdete Arten finden neuen Lebensraum. Agroscope Transfer, 332, 2020, 1-15

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