



Can agriculture adapt to Climate Change?

A review for North-East Germany

Climate Change in North-East Germany

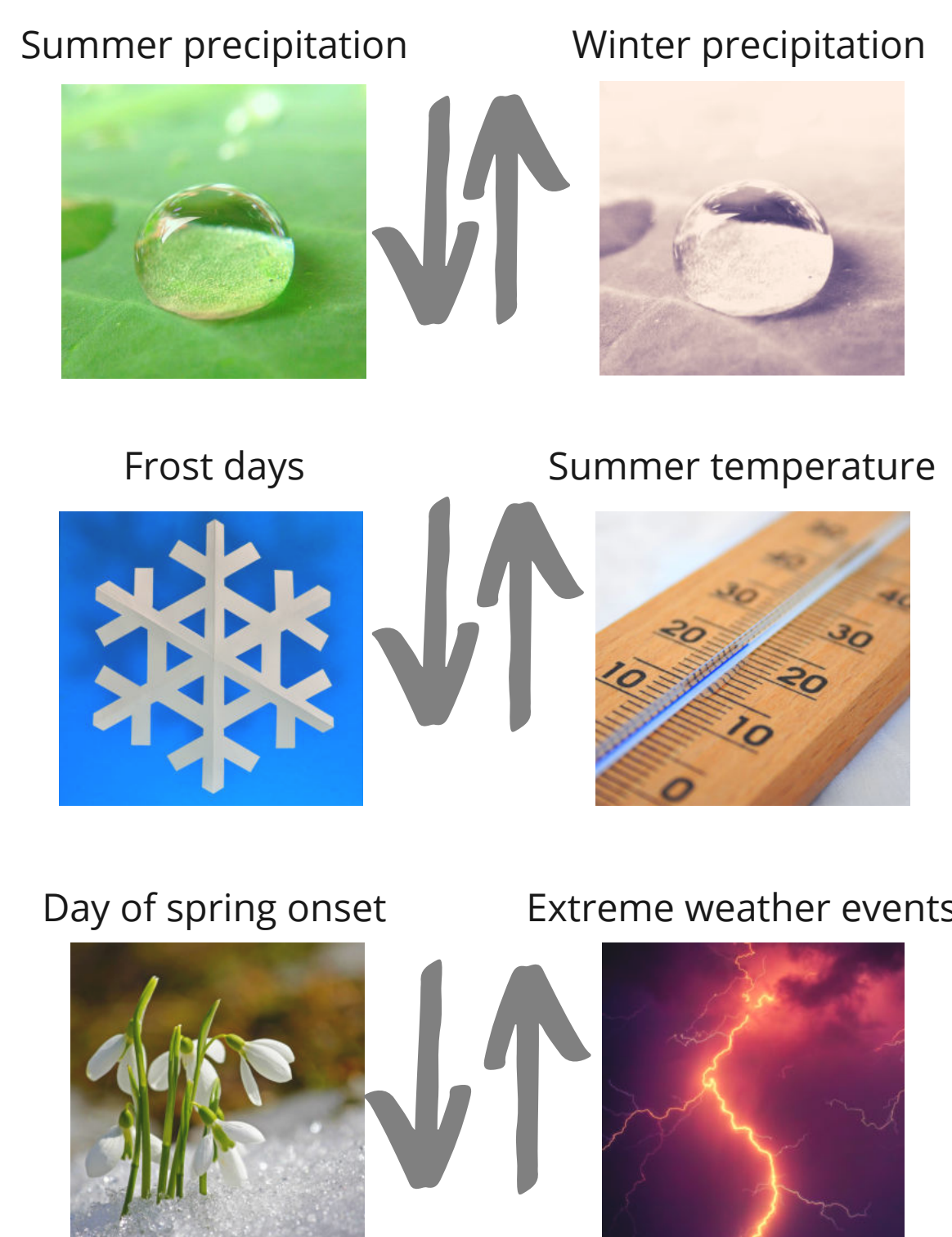


Fig 1: Most relevant projected effects of climate change in North-East Germany for agriculture.
↑ increasing, ↓ decreasing

Different regional climate models have something in common: in this century **temperatures** are projected to **increase** and **summer precipitation** to **decrease** [1]. Agriculture will need to handle summer droughts and extreme events, but also longer vegetation periods and less frost (Fig 1).

Here, we **reviewed**:

1. What are the **effects** of **climate change** (CC) on agriculture?
2. How is agriculture **contributing** to CC?
3. How can agriculture **adapt** to CC and **reduce** its effects?



See our video abstract to this topic online

Effects of climate change on agriculture

&

Effects of agriculture on climate change

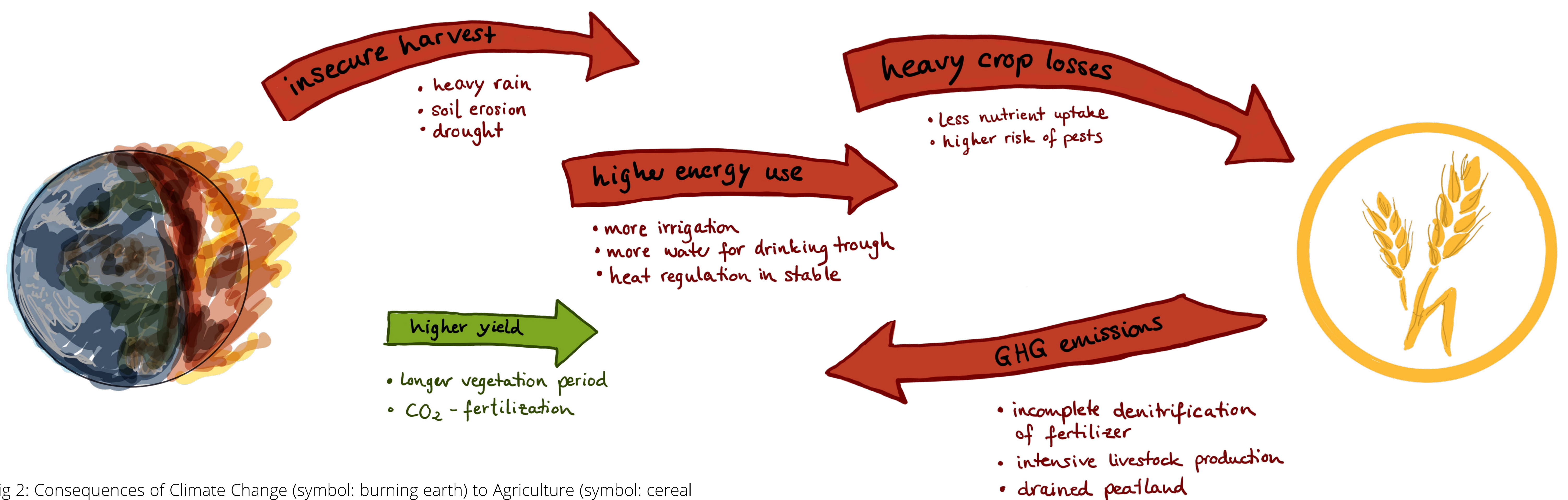


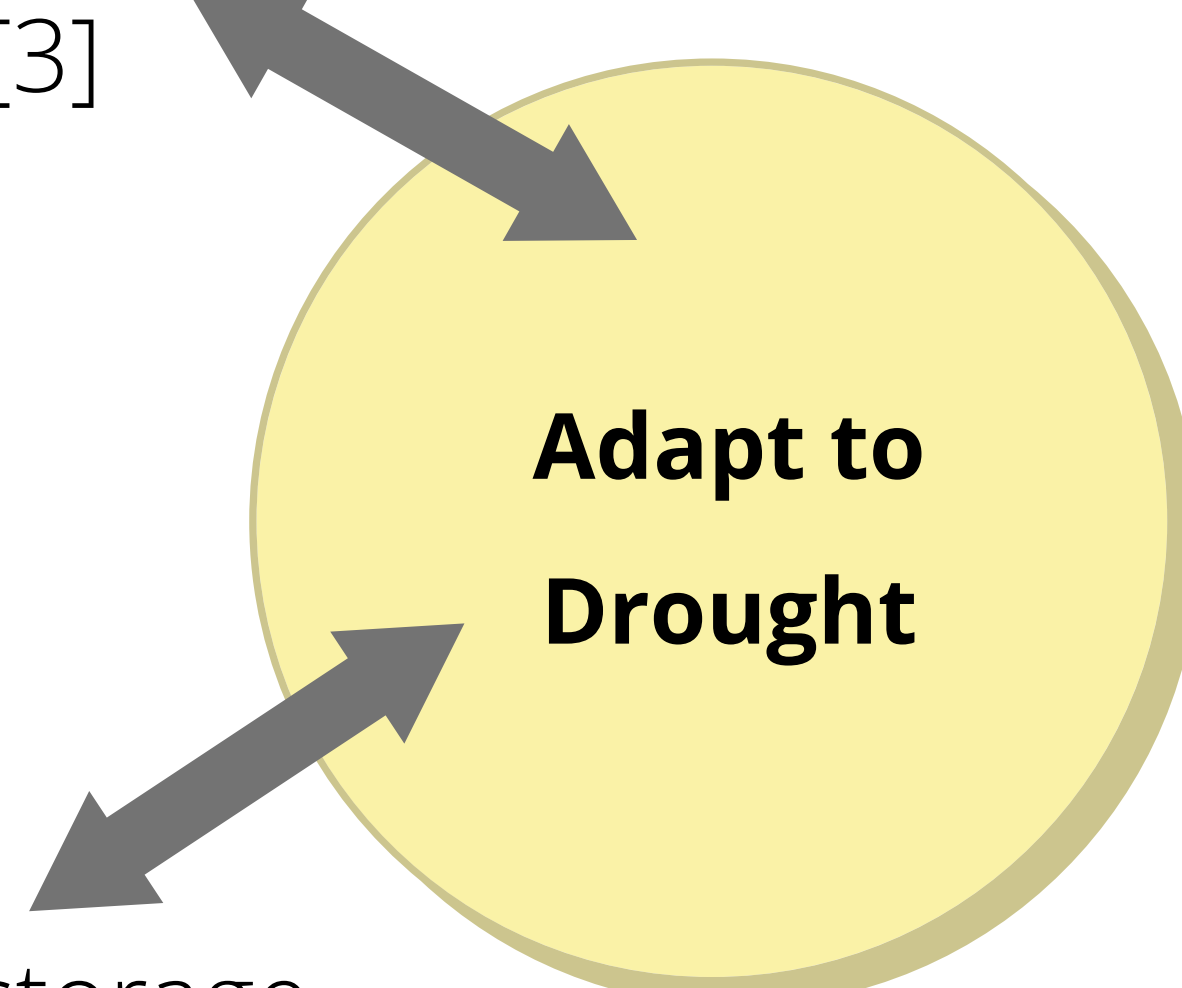
Fig 2: Consequences of Climate Change (symbol: burning earth) to Agriculture (symbol: cereal ear); especially higher temperatures and drought. Green arrow: positive effects, like e.g. economically beneficial. Red arrows: negative effects, e.g. higher effort and financial costs. [2]

Regional tasks

Nationwide tasks

Dealing with effects of CC

Cultivating **drought-resistant** sorts [3]

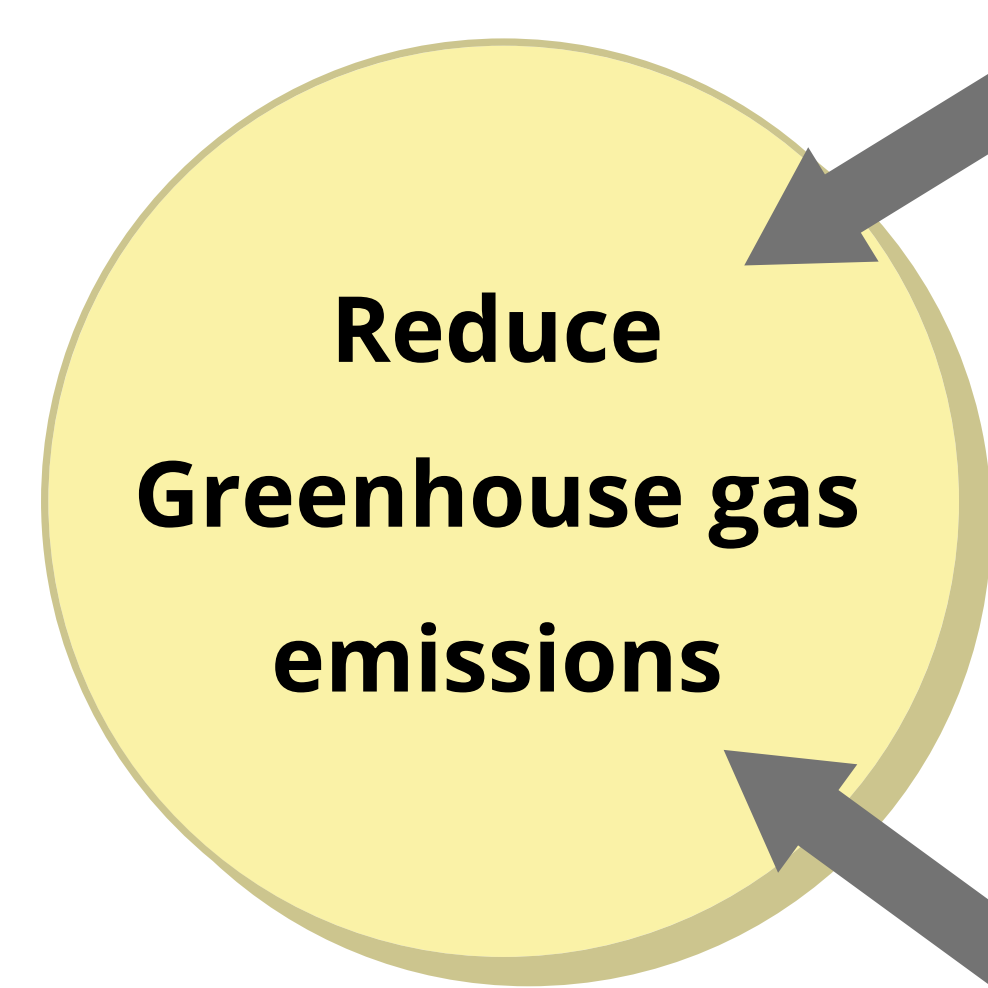


Enhance water storage capacity [3] - **humus** formation and soil conserving tillage



Reducing impact on CC

Reducing factory farming and the use of fertiliser



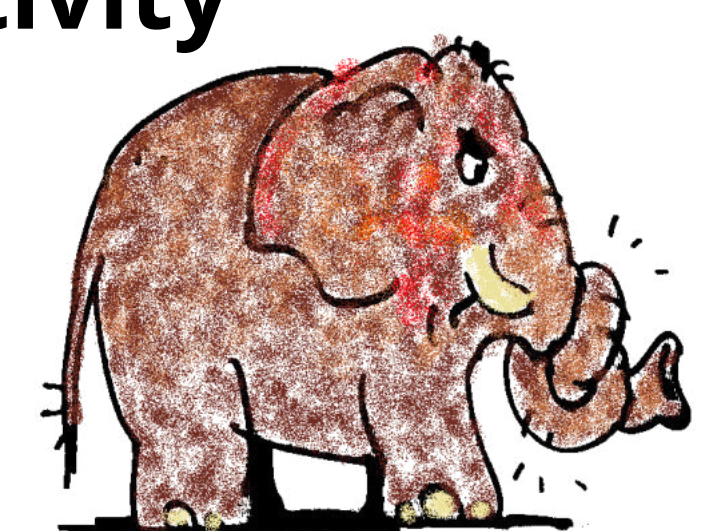
Paludiculture - Farming, but keeping peatlands wet

Political framework

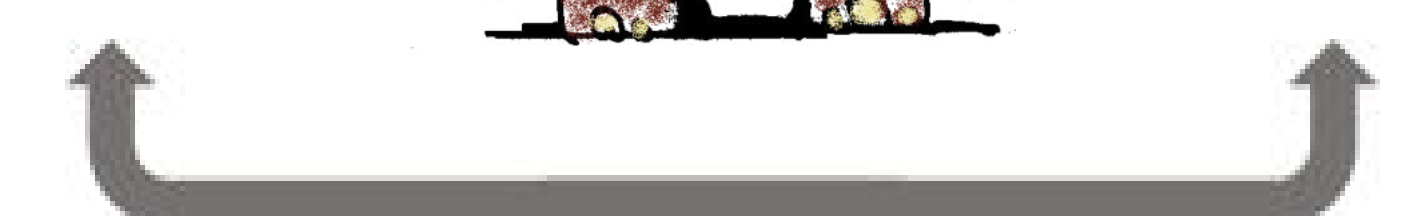
- **EU-directives** distribute most fundings
- **Communities can act:**
 - e.g. Project in Greifswald: land-leasing criteria allow enjoyment of Climate-friendly criteria [6].

Mammoth task:

Raising **productivity** for **population growth** and export [5]



Climate-friendly land use



Sources

[1] KlimaGIS Deutscher Wetterdienst. <https://www.dwd.de/DE/klima/klima/klima/klima/klima.html>. 25.05.2020.
[2] Förderbank für die Agrarwirtschaft und den ländlichen Raum (2019): Herausforderung Klimawandel. Auswirkungen auf die Landwirtschaft und Anpassungsstrategien. Band 35. Edmund Rehwinkel-Stiftung, Frankfurt a.M.
[3] Drastig, K., Prochnow, A., Brunsch, R. (2010): Wassermanagement in der Landwirtschaft (Discussionpaper No. 3). Berlin-Brandenburgische Akademie der Wissenschaften.
[4] Joosten H. (2018): Mire utilisation. The Contribution of paludiculture to climate change mitigation and adaptation. Lecture Lenc. Greifswald University.

[5] Osterburg, B., Rüter, S., Freibauer, A., de Witte, T., Elsassner, P., Kätsch, S., ... & Sanders, J. (2013). Handlungsoptionen für den Klimaschutz in der deutschen Agrar- und Forstwirtschaft (No. 11). Thünen Report.
[6] Beschluss vom 4.11.2019: „Änderungsantrag zu: Kriterien für die Neueingabe von landwirtschaftlichen Flächen (BV-V0)00637“. Greifswald.
Images
[7] <https://appreciategoods.com/sorghum>.
[8] Natural Resources Conservation Service Soil Health Campaign. CC BY 2.0 (cropped).
[9] bsp.fraunhofer. © typha technik Naturbaustoffe.

