

# German-Chinese Cooperation on Agriculture and Climate Change

## Workshop on Agriculture and Climate Change

18. November 2019, Beijing



State Office for  
Agriculture and  
Rural Area



## Sino-German Cooperation on Agriculture and Climate Change

### Workshop on Agriculture and Climate Change

Monday, 18 November 2019

Vanda Hall, Beijing Landmark Hotel

Keynote 1:

## Climate Change and Agriculture in Germany

**Dr. Frank Augsten**

Head of Department Agricultural Production, Horticulture and Education of  
Thuringian State Office for Agriculture and Rural Area

### Keynote 1: Climate Change and Agriculture in Germany

#### Contents

1. **Climate Change – facts and figures**
2. **Efforts on Climate Change - global, EU, Germany, Thuringia**
3. **Agriculture: both culprit and victim**
4. **Challenges and potential solution approaches**
5. **Discussion/Q&A**





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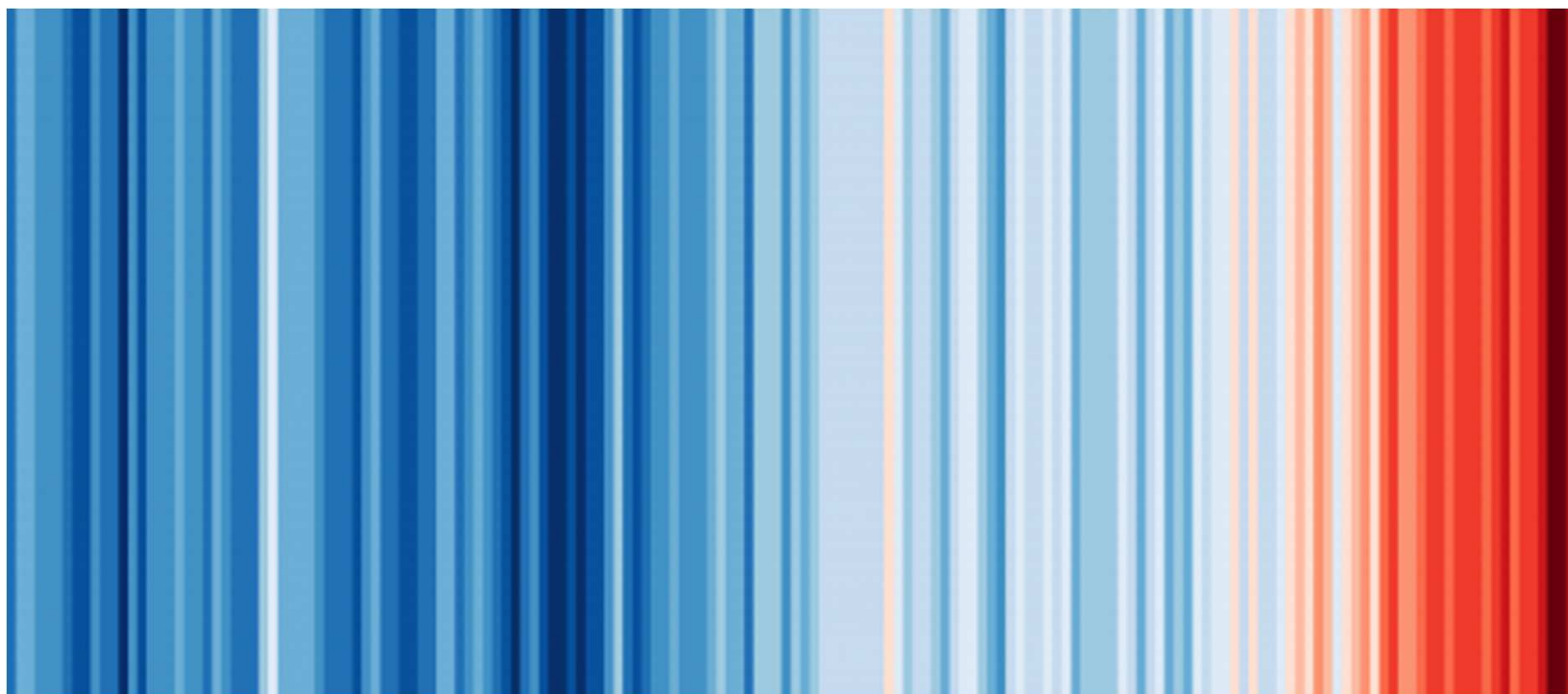
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Freistaat  
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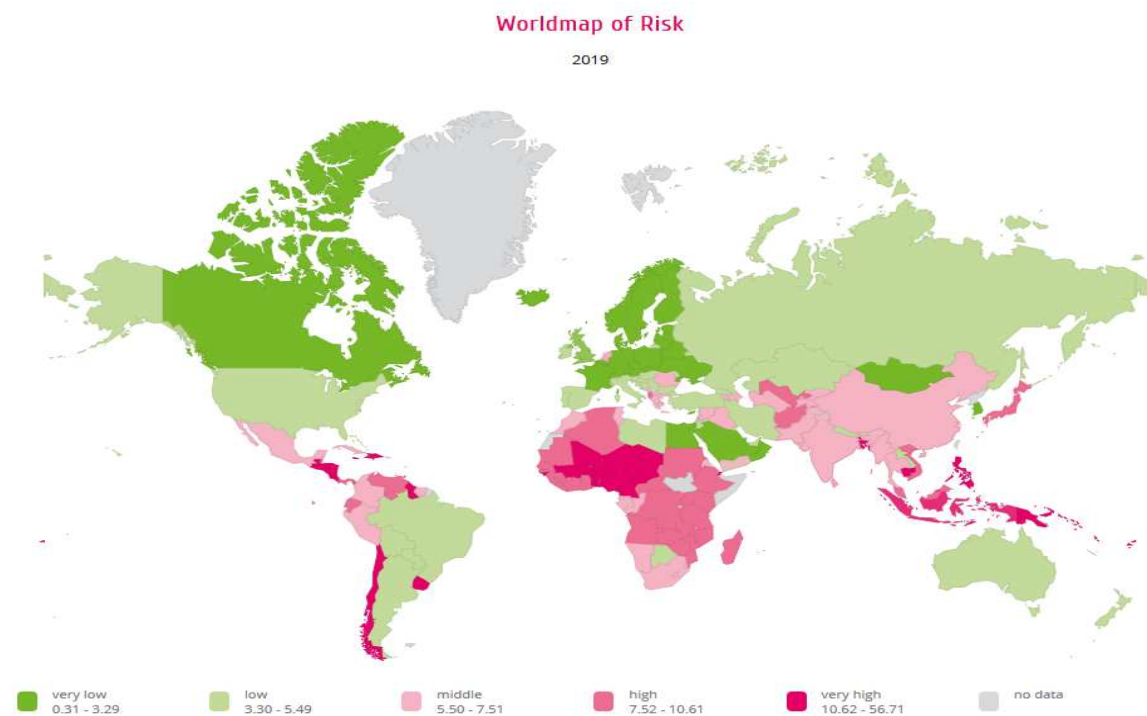
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The past five years (2014-2018) have been the five warmest years on record, according to the WMO Annual Statement on the State of the Global Climate. The year to date in 2019 is the third warmest on record, according to the U.S. National Oceanic and Atmospheric Administration.



## The World Risk Report



1.	Vanuatu	36,28
85.	China	6,39
147.	Germany	2,95
171.	Katar	0.08



## CO<sub>2</sub> concentration in the atmosphere in the last 400 000 years



Graphic: Katja Hommel  
Source: [NASA](#)

→ climate change is man-made

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### Keynote 1: Climate Change and Agriculture in Germany

#### Global level





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#### Global level

#### **Kyoto Protocol** on the reduction of greenhouse gas emissions

- 1<sup>st</sup> commitment period (2008 – 2012)
- 2<sup>nd</sup> commitment period (2013 – 2020)
- Adopted by 160 countries

#### **Paris Agreement**

- First-ever universal, legally binding global climate deal
- The agreement sets out a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C.
- Result of the Paris climate conference (COP21) in December 2015
- Adopted by 195 countries





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#### EU Level

## COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A policy framework for climate and energy in the period from 2020 to 2030

Key targets until 2030:

At least 40 % cuts in **greenhouse gas emissions** (from 1990 levels)

At least 32 % share for **renewable energy**

At least 32.5 % improvement in **energy efficiency**





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### Germany

### German Climate Change Bill and Climate Protection Program

- Adopted by the federal government in October 2019
- The world's first legally binding national convention
- Reduction of the GHG emissions by at least 55 % by 2030
- 10 measures in agriculture



### Der Weltmeister ist nackt

Treibhausgasemissionen Deutschlands von 1990 bis 2017



Graphic: Katja Hommel

Source: Federal Environmental Agency

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#### Thuringia

#### Thuringian Climate Protection Law (2019)

- Reduction of GHG emission by 60 – 70 % by 2030, 70 – 80 % by 2040 and 80 – 95 % by 2050 (on basis of 1990)

#### Integrated programme of measures to adapt the impacts of climate change (IMPAKT)

- IMPAKT I (2013): Programme for climate protection and adaptation measures
- IMPAKT II (2019): Updateable of the programme

#### KlimAdapTIT - Development of Climate Adaptation Strategies and Technologies in Thuringia (Project 2015 – 2018)

#### Thuringian State Office for Agriculture and Rural Area

Leading theme: Reduction of climate-relevant emissions from Thuringian agriculture (Climate plan 2050)





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#### Agriculture as Culprit (Germany)

- approx. 60 % of total methane emissions
- approx. 80 % of total nitrous oxide emissions
  
- 72 Mio t CO<sub>2</sub> equivalents = approx. 8 % of the total national GHG emissions (12 % when consequences of land use changes are included, esp. soybean imports from US and South America)

#### Main causes

- Agricultural use of moors (breaking grassland to farmland)
- Animal husbandry
- High energy consumption for production and use of fertilizer and plant protection products
- Land use change abroad





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### Agriculture as Victim (Germany)

7 serious extreme weather events between 2002 and 2019

- 2002: high water and flooding (422 Mio € from EU)
- 2003: aridity and dryness (36 Mio € from EU)
- 2007: hurricane Kyrill (damages: 2,4 billions €)
- 2013: high water and flooding (213 Mio € from EU)
- 2015: aridity and dryness
- 2018: record summer with aridity and dryness
- 2019: record summer with aridity and dryness

### Strong regional differences



Foto: C. Guddat, TLLLR



Source: Landpixel



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## Climate change: possible effects on global agriculture

### 1. Ceasing agricultural production

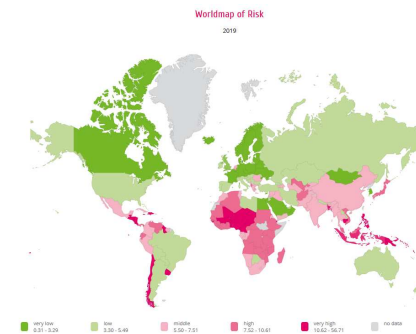
- Water availability  
(disappearance of glaciers, overuse of groundwater)
- Desertification
- Loss of fertile soil and feed supply

### 2. New options

- Extension of the vegetation period
- New arable crops and animals

### 3. Adaptation

- **Possibility of successful implementation of adaptation strategies**





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#### German Climate Change Bill → 10 Measures in Agriculture

1. Lowering nitrogen surplus and emissions
2. Energetic use of manure and agricultural residues in biogas plants
3. Expansion of organically farmed area
4. Emission reduction in livestock farming
5. Increasing energy efficiency
6. Build-up of humus in arable land
7. Preservation of permanent grassland
8. Protection of moorland, reduction of peat use in gardening substrates
9. Conservation and sustainable management of forests and timber use
10. Avoidance of food waste





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#### Concrete examples of the application:

##### Water storage in soil

- Sprinkling machines and drip irrigation
- One system for both irrigation and drainage
- Soil-conserving management
- Shading systems

##### Preservation of soil fertility

- Manure application (injection)
  - ensure maximum use of manure nutrients
- Preservation and building-up of humus
- Prevention of soil emission
- Use of biochar



Source: Cordula Möbius



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#### Concrete examples of the application:

##### Breeding

- New plant varieties and animal breeds
- Focus on resilience
- Focus on winter arable crops

##### Digitalization

- Smart farming/precision farming
- Reduction of manure and plant protection products
- Weed control (field robotics)
- Smart livestock
- Sensor technology for animal welfare
- Barn climate monitoring and regulation



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**Thank You for Your Attention.**

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