

## Possibilities to optimize irrigation in Lower Saxony, Germany

Irrigation management and capacity building as a key to mitigate the effects of climate change

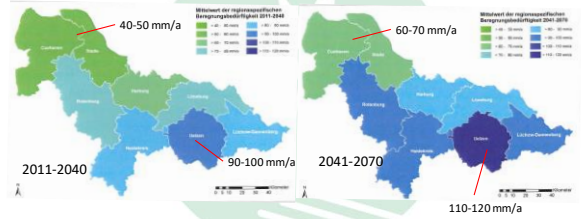
Dominic Meinardi, Klaus Roettcher Ostfalia University, Suderburg and Johanna Schroeder, Thünen Institute

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## Future irrigation demand



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## Irrigation in Germany

- In Germany 5.000 to 6.000 km<sup>2</sup> under irrigation this is around 2-3.5% of the total agricultural land
- 40% of all irrigated areas are in the north east of the federal state Lower Saxony
- In the county Uelzen nearly 100% of all agricultural land could be irrigated
- The reason is the sandy soil not the rainfall (600 – 700 mm/year)
- Irrigation was done with gun and center pivot irrigation machines with a pressurized network

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## Approaches to adapt irrigation to climate change in Lower Saxony

- Example 1: Using sensors to optimize time and amount of water  
Example Crop Water Stress Index (CWSI) in Potatoes
  - Thermal sensor network (stationary and mobile)
  - Meteorological data
  - Irrigation following CWSI in 2019 as a pilot test
- Example 2: Capacity Building
  - Building an expert Network
  - Use E-learning to transport research results to practice

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## Focus region North-East Lower Saxony



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## Sensor Network



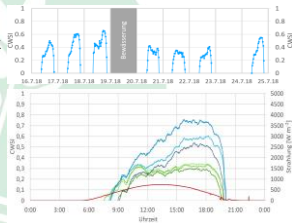
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### Crop Water Stress Index (CWSI)

- The course of CWSI over a week
- Diurnal variation of CWSI

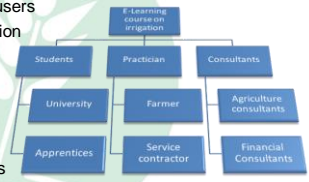


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### Capacity Building

- Tailored courses for individual users
- Knowledge transfer and education
- Direct impact from training practitioners
- Future relevant development of irrigation infrastructure
- Ensure best practices implementation through updates



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### Irrigation and Water Expert Network / Think Tank initiative

- Institute and Association on sustainable irrigation and water management in rural areas - founded in 2018/2019
  - Efficient coordination of research activities between researchers and practice
  - Establish a comprehensive network
  - Transfer research results into practice
  - Develop innovative ideas and research questions
  - Maintain good communications and public image
  - Think tank on irrigation and water management issues



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### Future activities for adaptation to climate change: research project DirriGENT

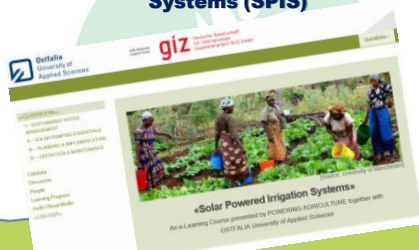
- Mobile App to track irrigation water use
  - Fulfill reporting duties
  - Data verification
  - Statistic analysis on
    - Water budget
    - Water consumption per crop
    - Water demand per plot
  - Early warning
  - Crop planning
  - Seasonal irrigation planning
  - Integration of weather, pump and sensor data



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### Capacity Building Example E-learning course Solar Powered Irrigation Systems (SPIS)



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