

# MODELLING CLIMATE IMPACTS ON AGROECOSYSTEMS IN BURKINA FASO

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How can short- and long-term crop production projections lead to higher food security?



A landscape photograph featuring a large, billowing white cumulus cloud in the center of the sky. The sky is a clear blue with some wispy clouds. In the foreground, there is a field of tall, golden-brown grass. Several trees are scattered across the middle ground, including a prominent acacia tree on the right. In the background, a range of low mountains is visible under the sky. A green rectangular text box is superimposed over the center of the image, containing the text "CURRENT SITUATION" in white, uppercase letters.

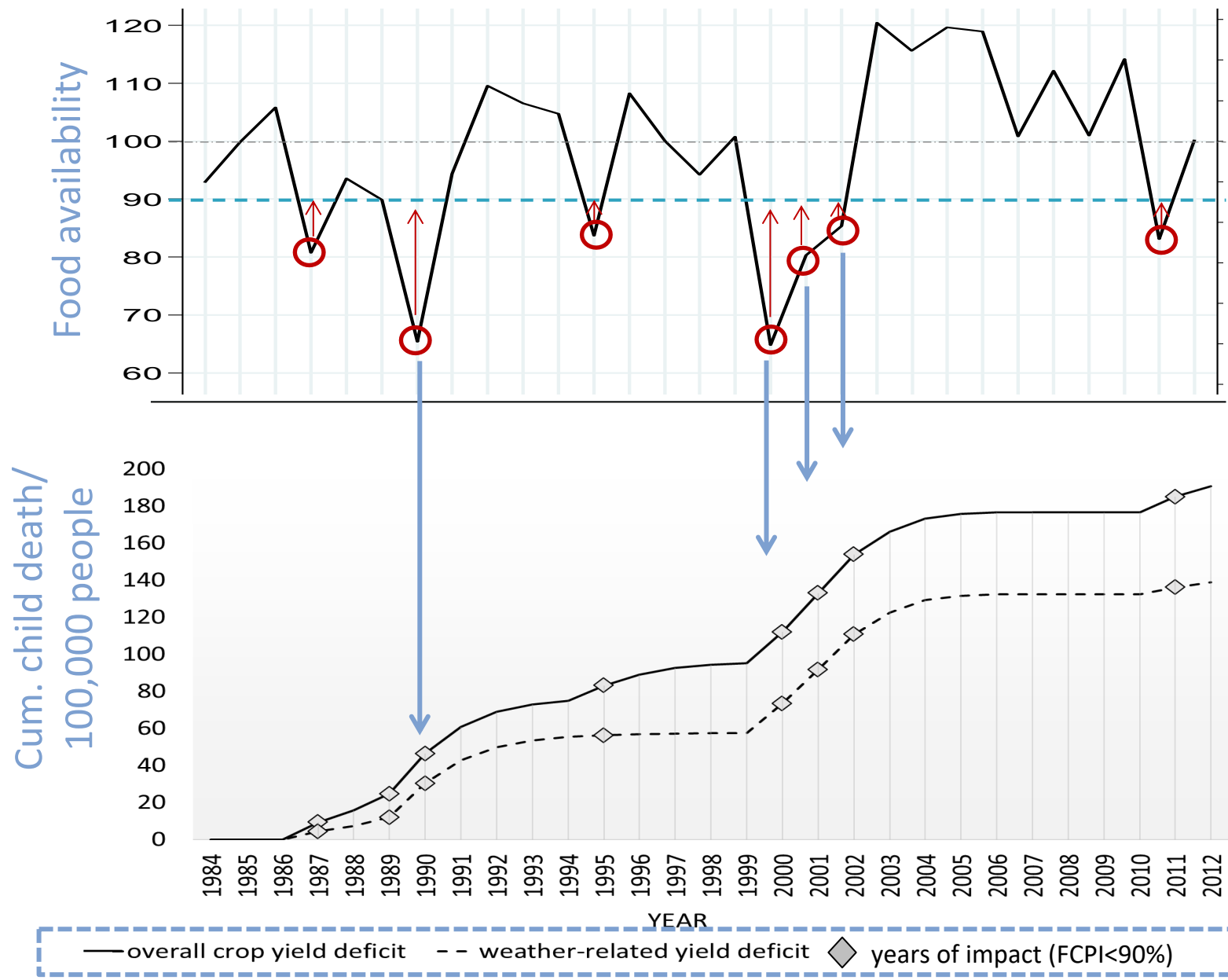
# CURRENT SITUATION

# Mortality Impact of Annual Crop Yield Variation in Burkina Faso



Calculation of a food availability index by the production-weighted crop yields

Child mortality (< 5yr) attributable to weather induced food shortages (Food Crop Productivity Index < 90%)



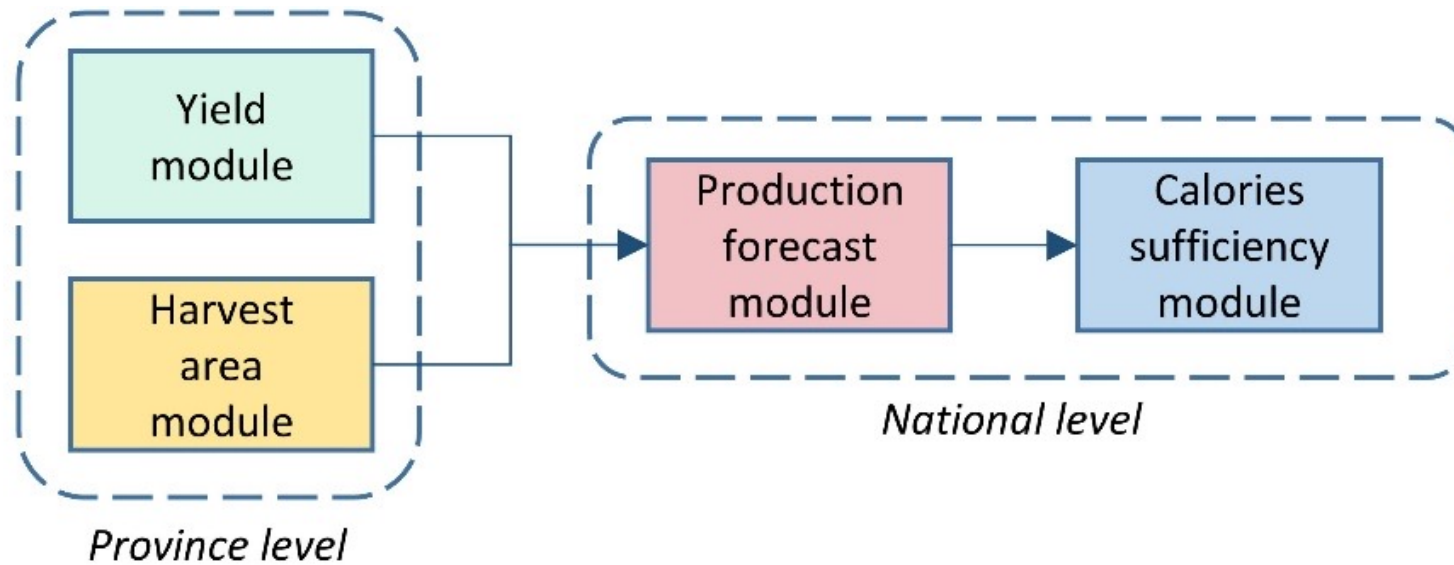


A photograph of a sorghum field at sunset. The sun is low on the right side, creating a warm orange glow and silhouetting the tall sorghum stalks. A semi-transparent green rectangular box is centered horizontally across the middle of the image, containing the text "SHORT-TERM CROP FORECASTS" in white, uppercase, sans-serif font.

# SHORT-TERM CROP FORECASTS



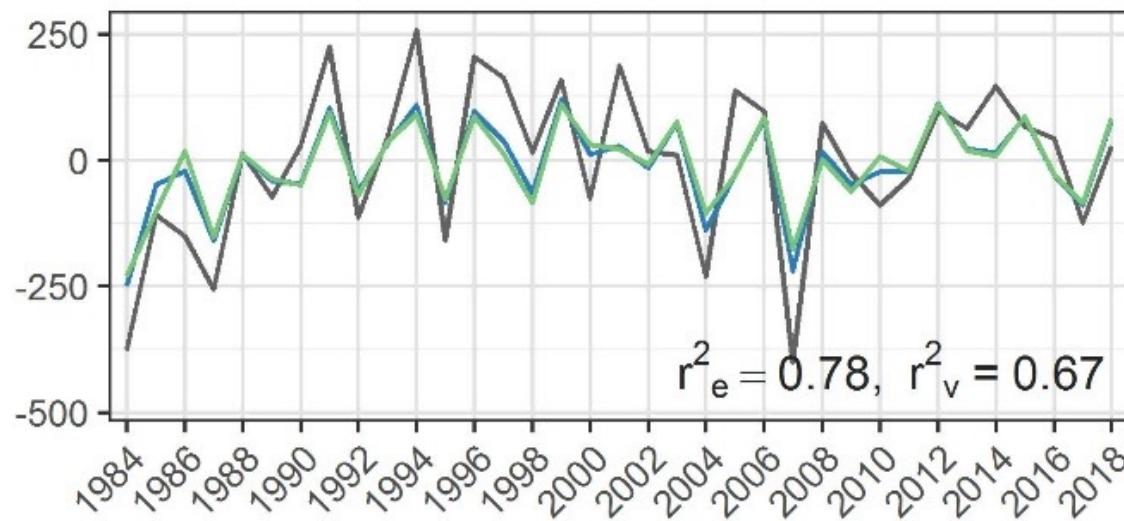
# Food availability forecast



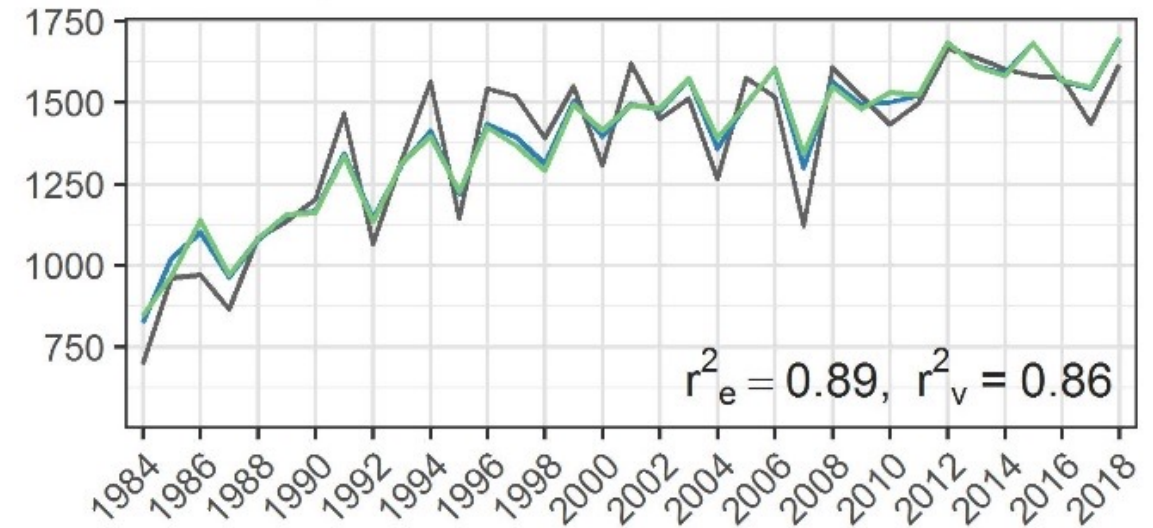


# Food availability forecast – Crop yields

**a** Maize  
Anomalies



**b** Absolute yields

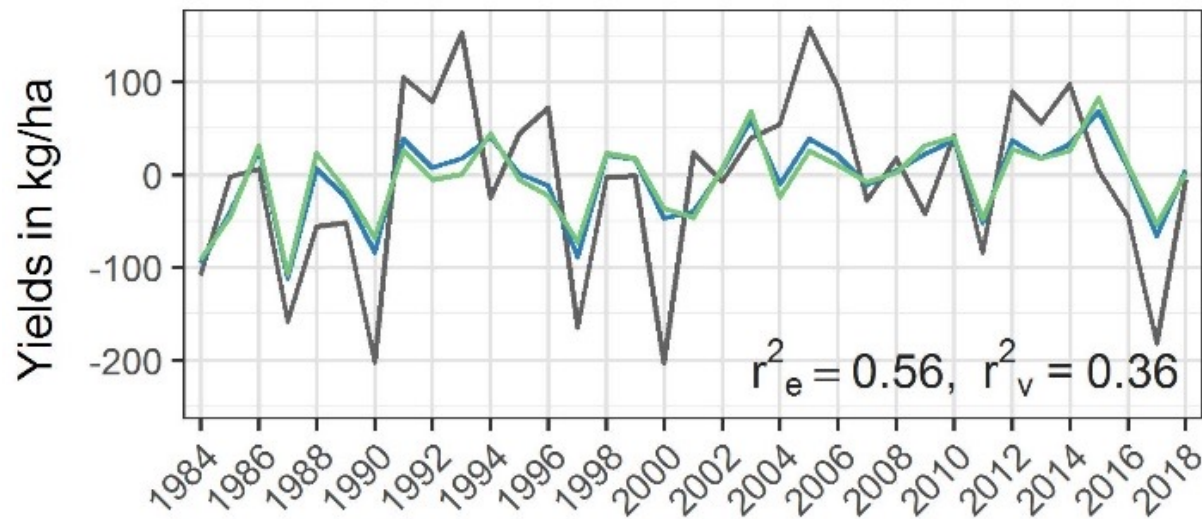


— Observed — Estimated — Out-of-sample



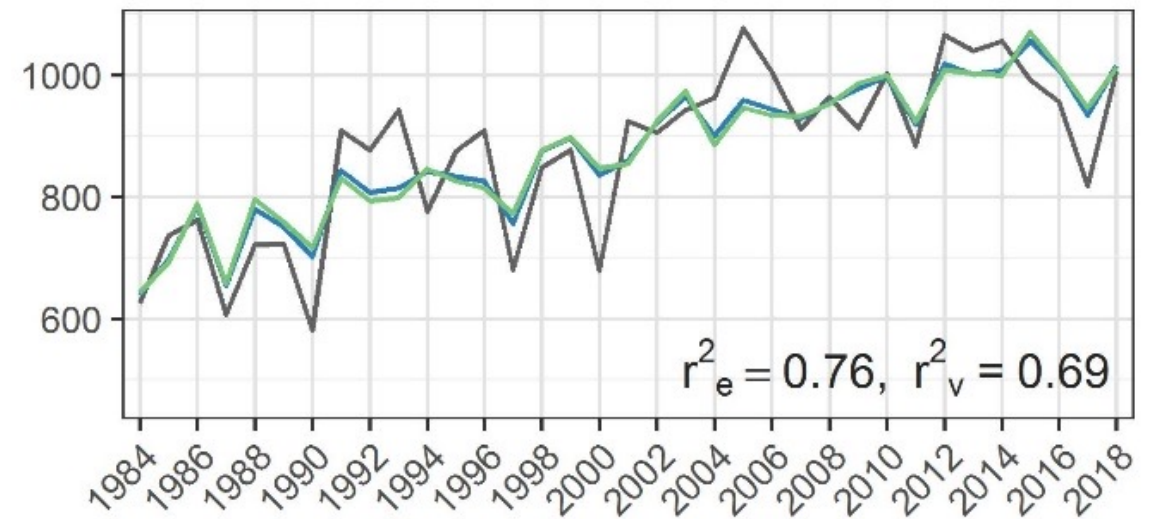
# Food availability forecast – Crop yields

**c** Sorghum  
Anomalies



**d**

Absolute yields

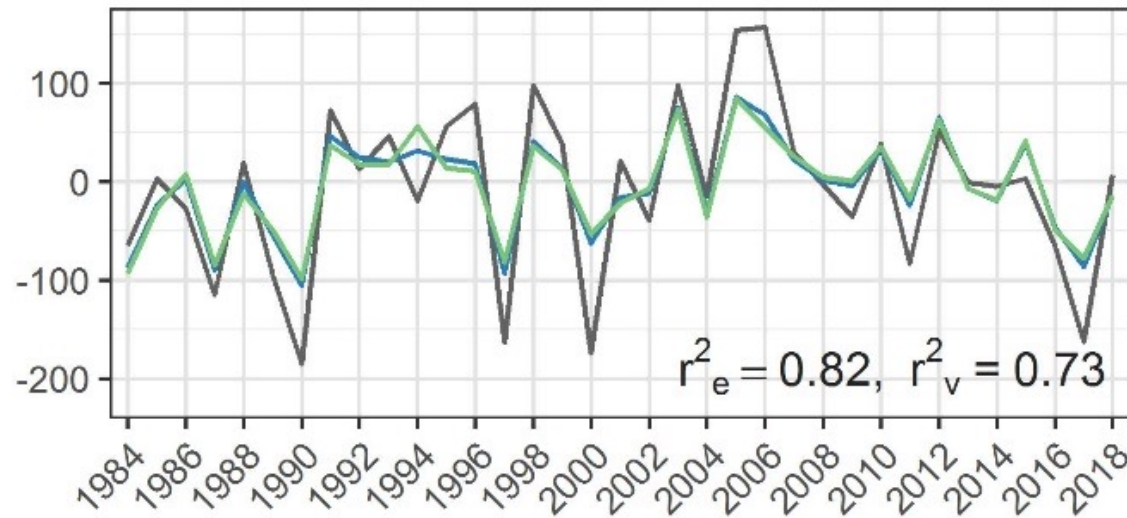


— Observed — Estimated — Out-of-sample

# Food availability forecast – Crop yields

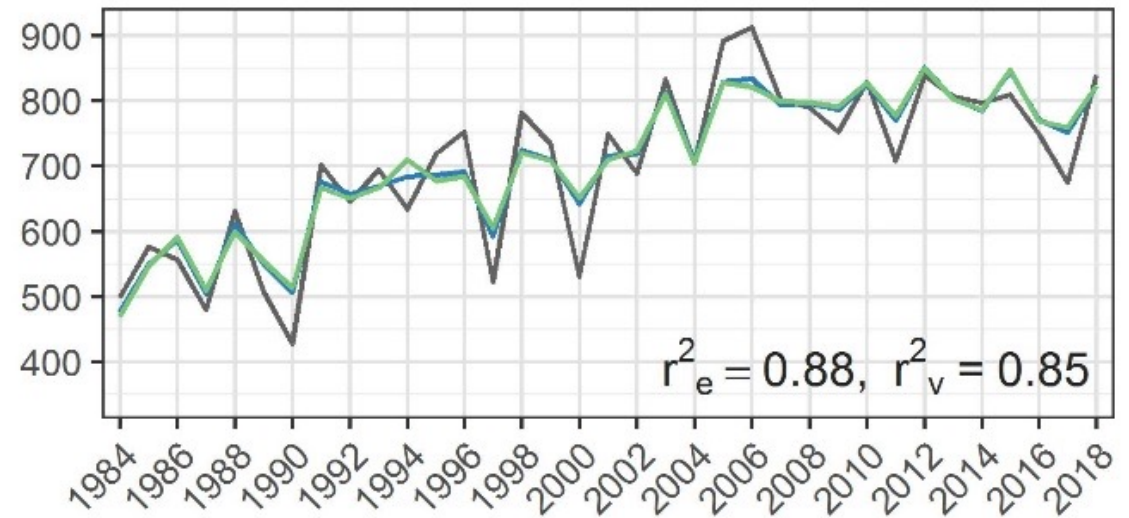
**e** Millet

Anomalies



**f**

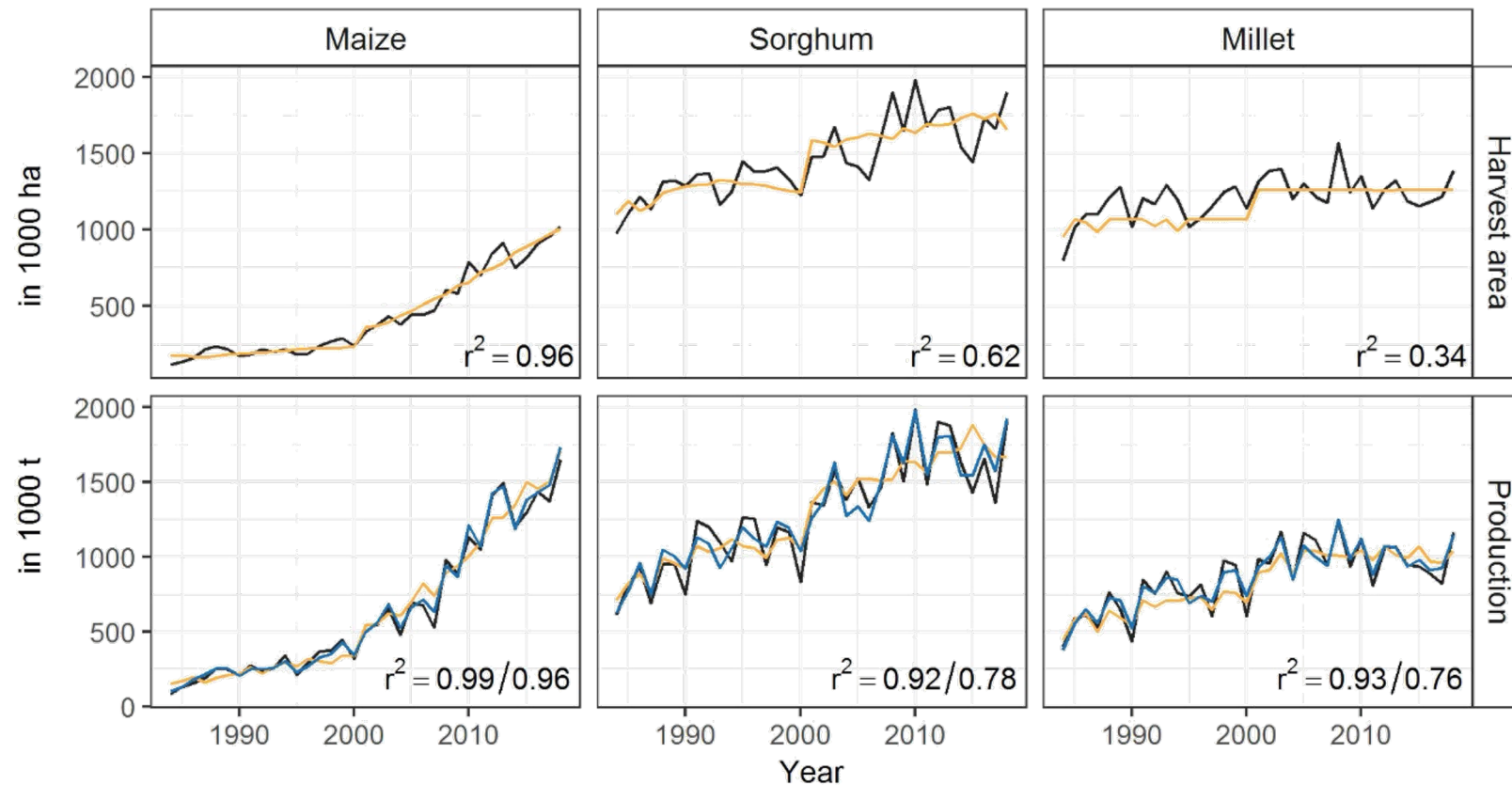
Absolute yields



— Observed — Estimated — Out-of-sample



# Food availability forecast – Harvest area



— Observed area      — Observed production  
 — Modelled area      — Modelled production based on modelled area  
 — Modelled production based on observed area

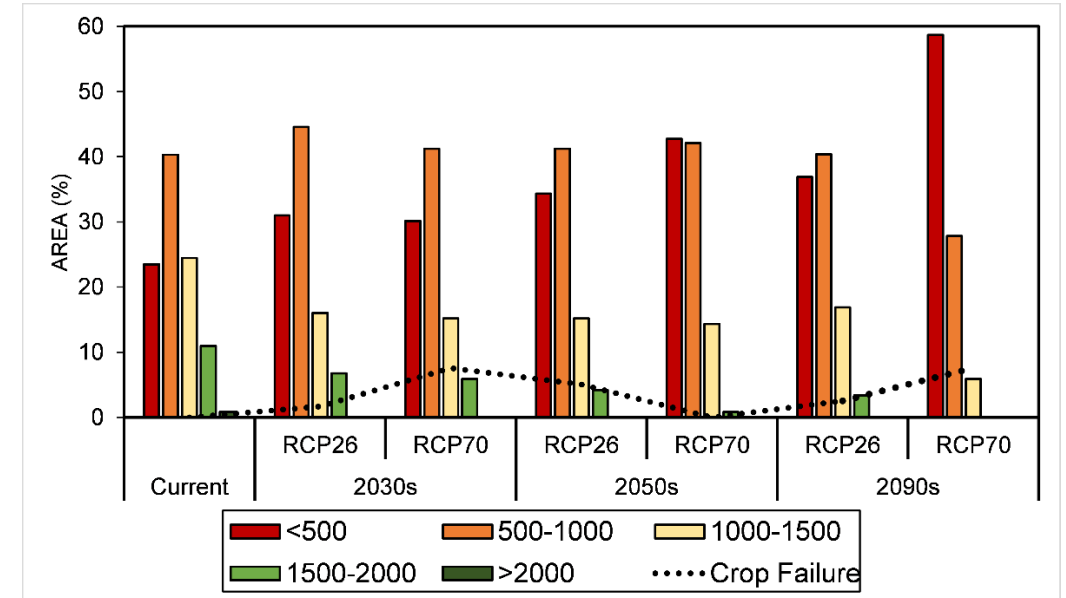
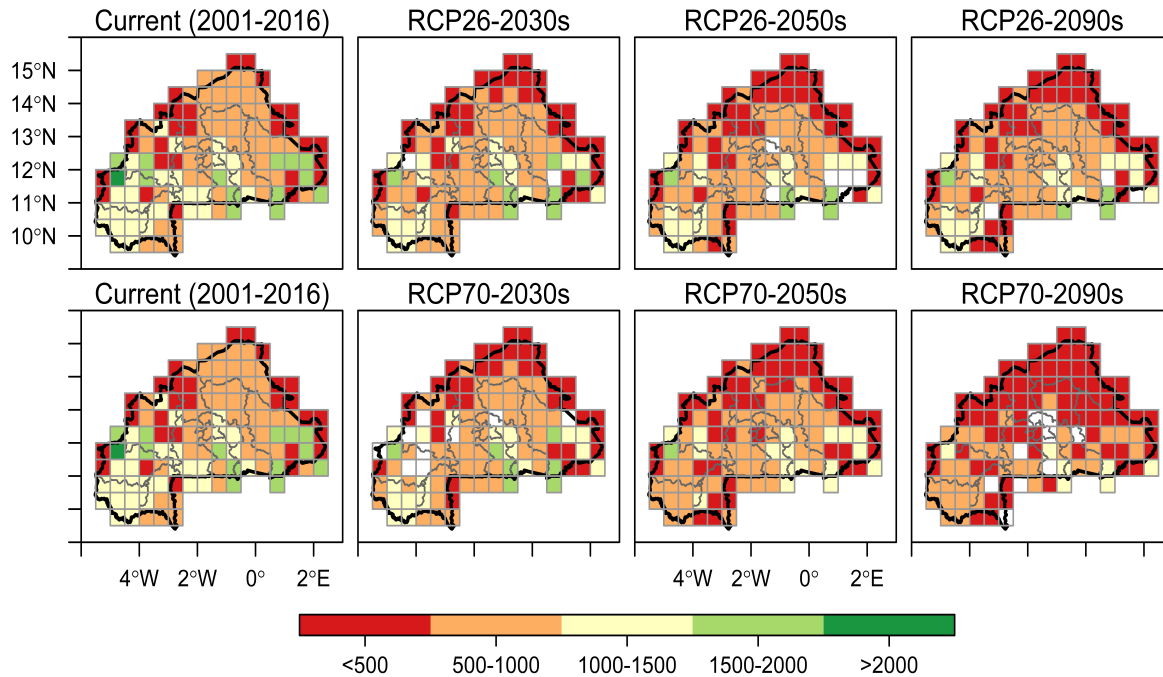




# LONG-TERM CROP PROJECTIONS

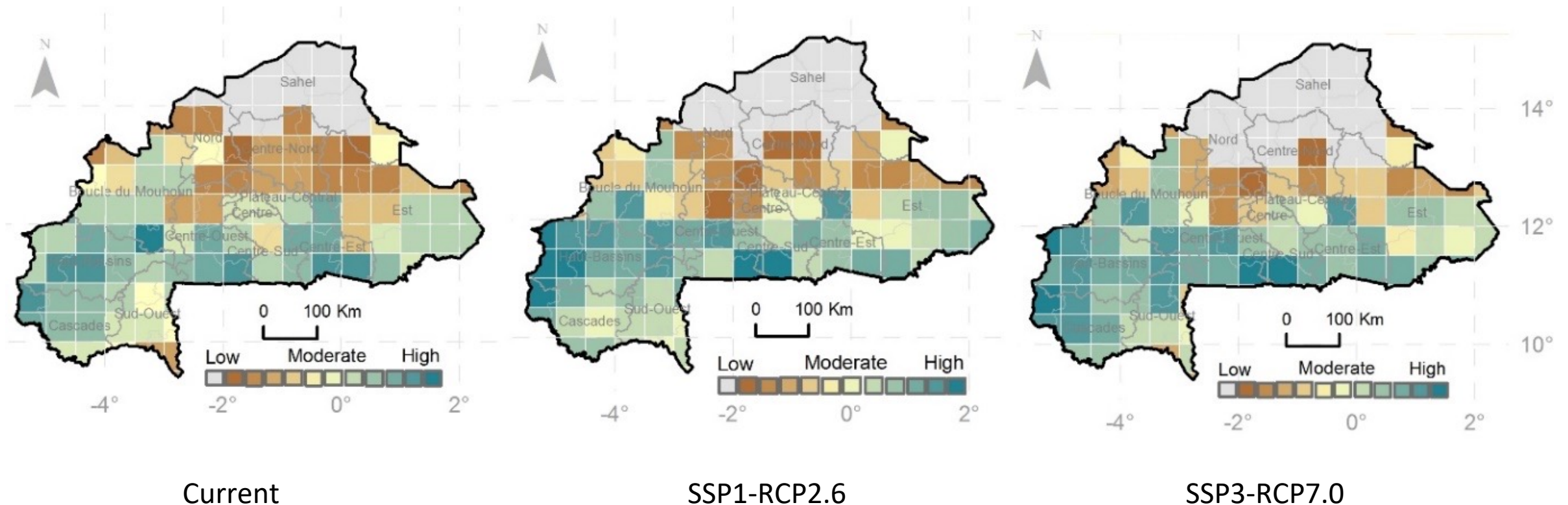


# Future yield simulations (SSP1-RCP2.6 SSP3-RCP7.0)



1. High yields in the western and southern parts.
2. Low yield areas increasing with time while high yield areas diminish.
3. More severe yield impacts under RCP7.0 compared to RCP2.6.
4. Most changes are in the eastern parts of the country.

# Potential for multiple crop suitability under current, SSP1-RCP2.6 SSP3-RCP7.0 scenarios by 2050 in Burkina Faso.





# Conclusion

- Science can **reduce uncertainty** about short- and long-term **climate impacts on crops**
- There is a high certainty in all climate impact studies that immediate action is needed to **prevent substantial damages on the agricultural sector**
- Climate change impacts on agriculture differ regionally and temporally; **adaptation thus needs to be context-specific**
- **Adaptation** is more **cost-effective than coping** with the risks of climate change



U N I K A S S E L  
V E R S I T Ä T

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Thank you.

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