



# Environmental benefits of relocating global croplands

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# Environmental impacts of agriculture

Carbon emissions



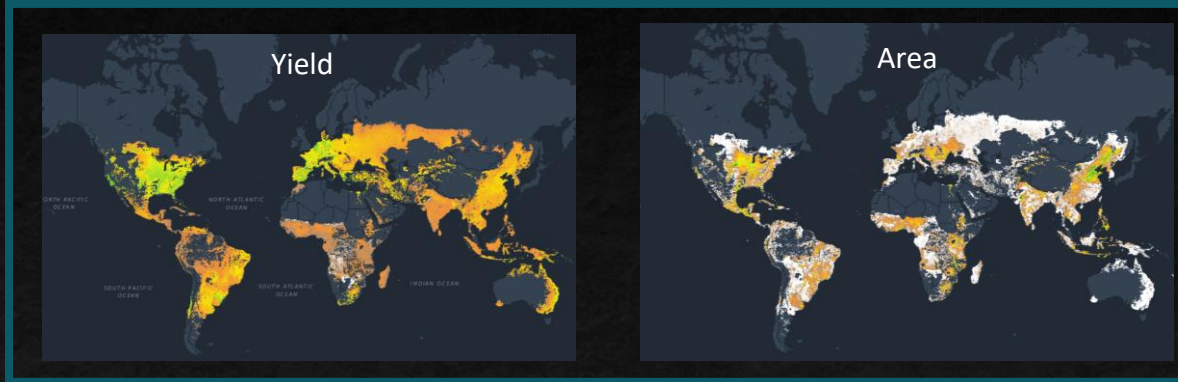
Biodiversity loss

Freshwater use

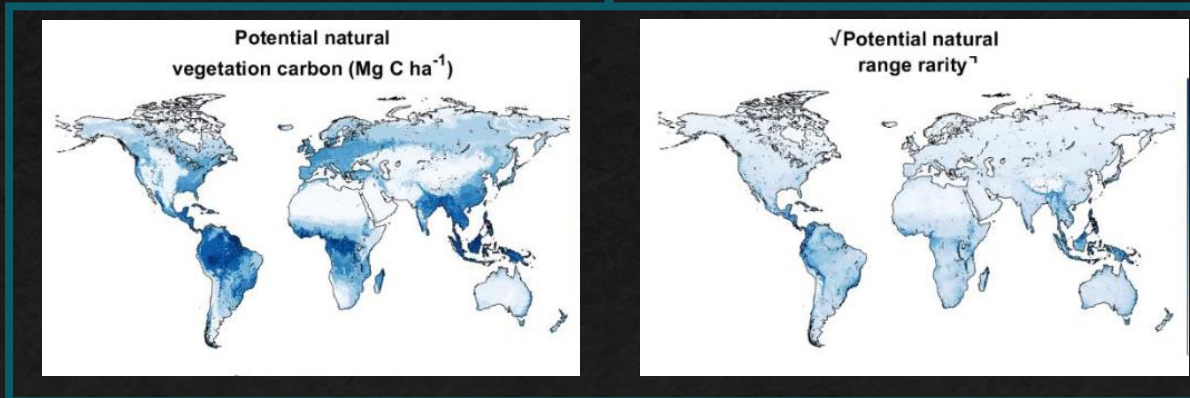


# Heterogeneous impacts-per-yield

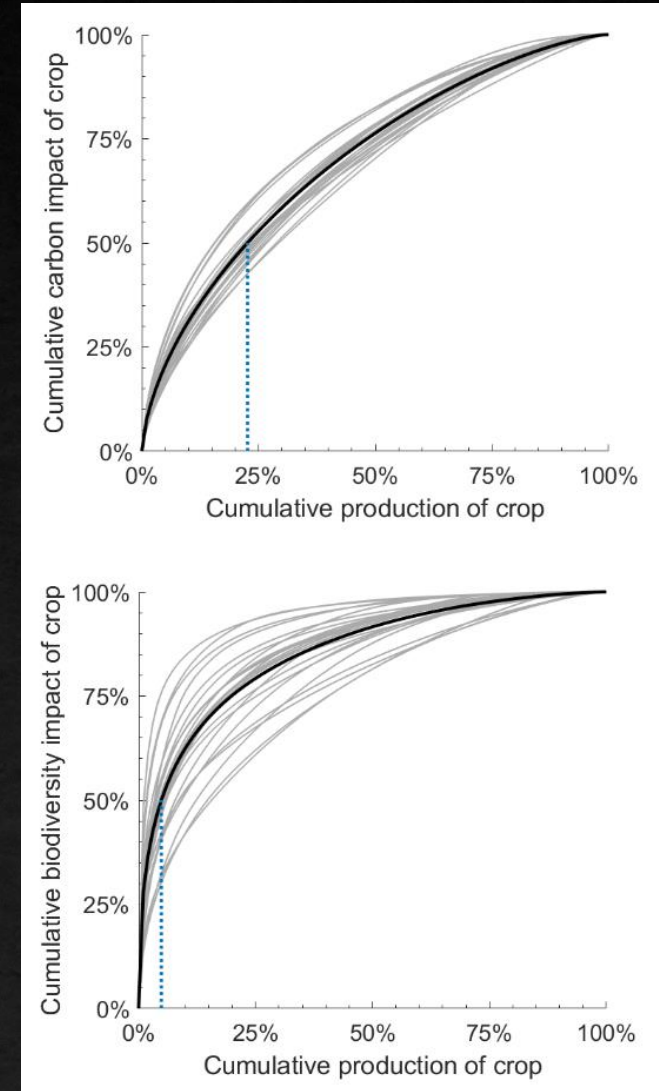
Crop data



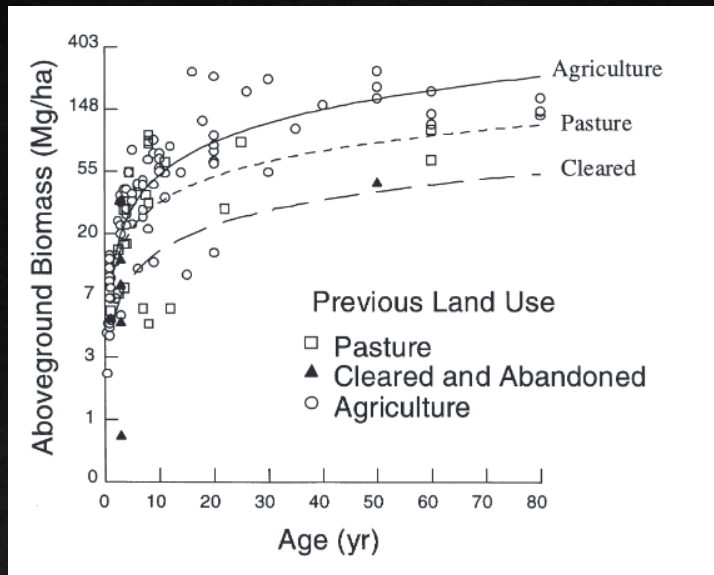
Impact data



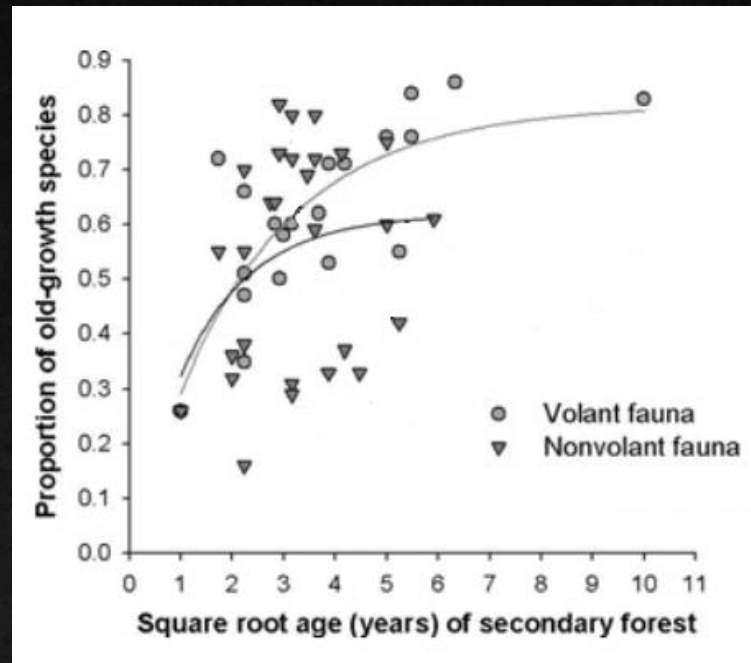
Crop impact  $\stackrel{\text{def}}{=} \text{Natural state} - \text{Crop-specific state}$



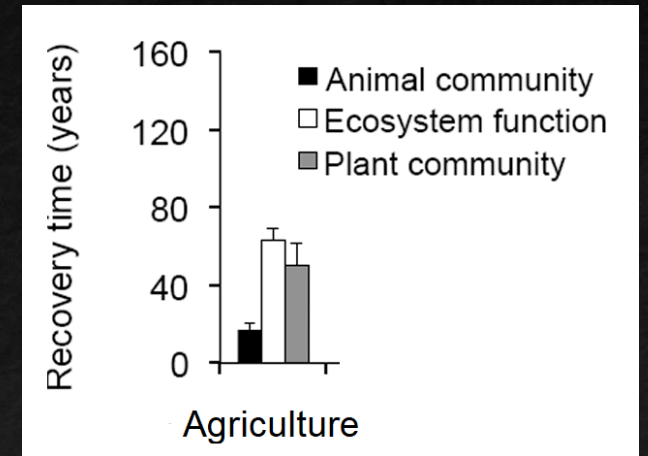
# Carbon and biodiversity recovery on abandoned cropland



Silver et al. (2000)



Chazdon et al. (2009)



Jones & Schmitz (2009)

# Optimising global cropland distribution

FAO Food and Agriculture Organization of the United Nations | GAEZ v4 Data Portal

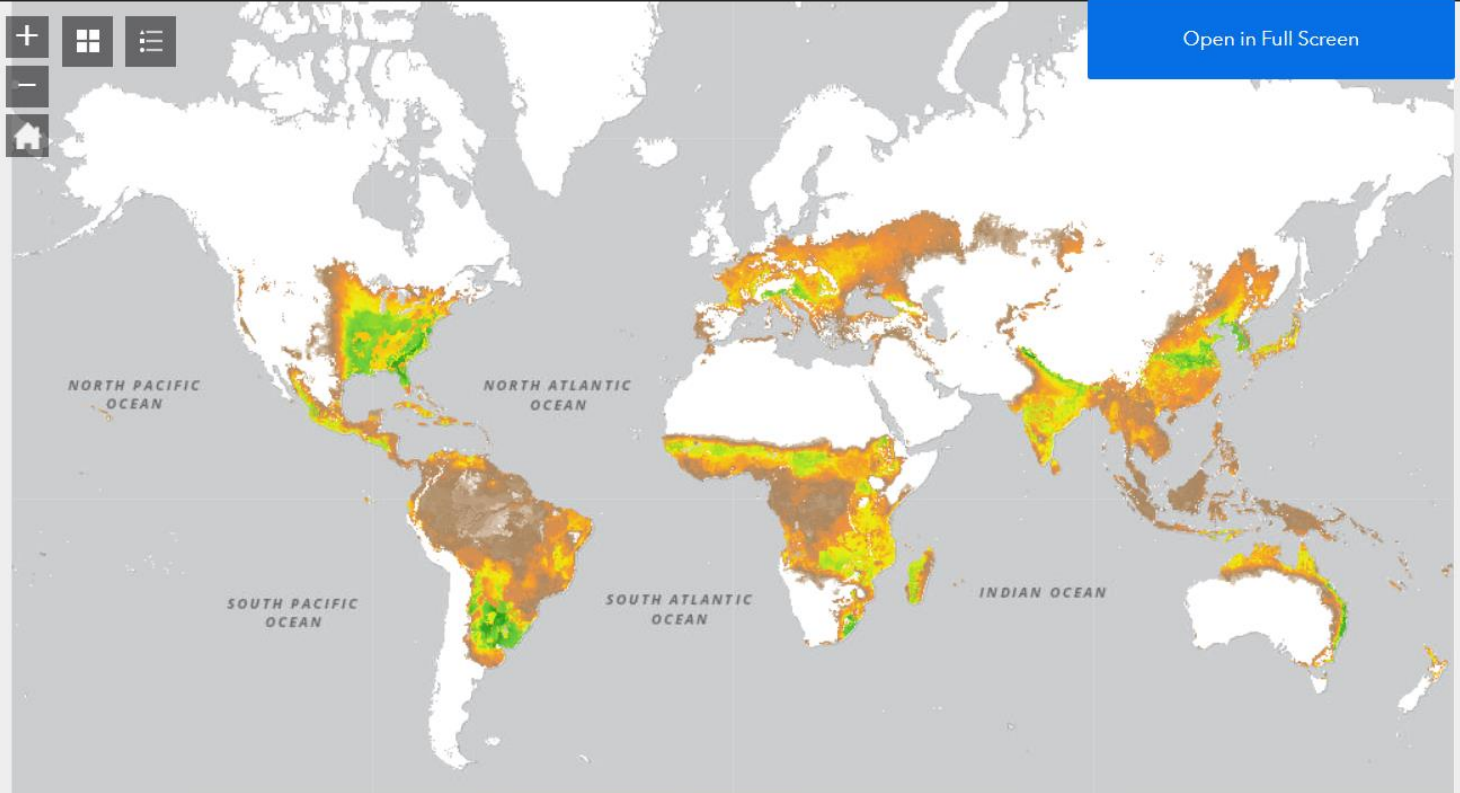
DATA VIEWER | GAEZ THEMES | DATA ACCESS | SUMMARY TABLES | SUPPORTING DOCUMENTATION | COMMUNITY | COUNTRY DATA | ECOCROP | - Translate Home Page -

1 - Land and Water Resources | 2 - Agro-climatic Resources | 3 - Agro-climatic Potential Yield | **4 - Suitability and Attainable Yield** | 5 - Actual Yields & Production | 6 - Yield and Production Gaps

Filter Rasters

- Time Period is: 1981-2010
- Climate Data Source is: CRUTS32
- RCP is: Historical
- Crop is: Maize
- Water Supply is: Rainfed
- Input Level is: High
- CO2 Fertilization is: With CO2 Fertilization

Choose Renderer | About this Data

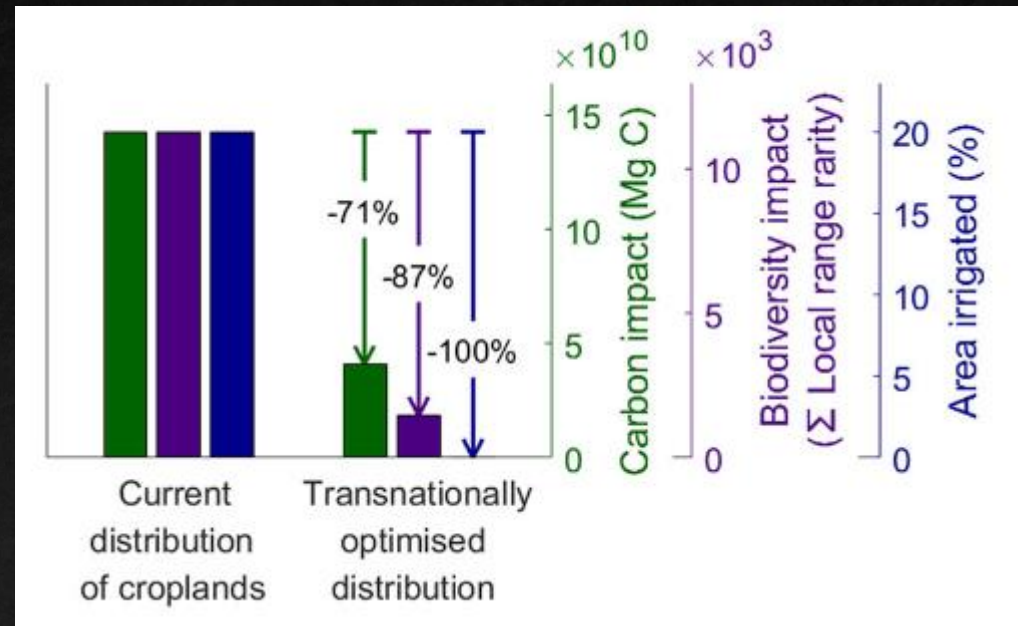
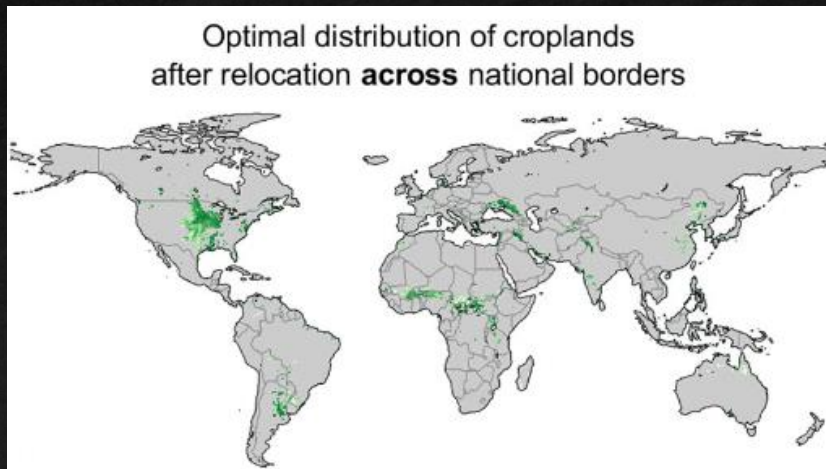
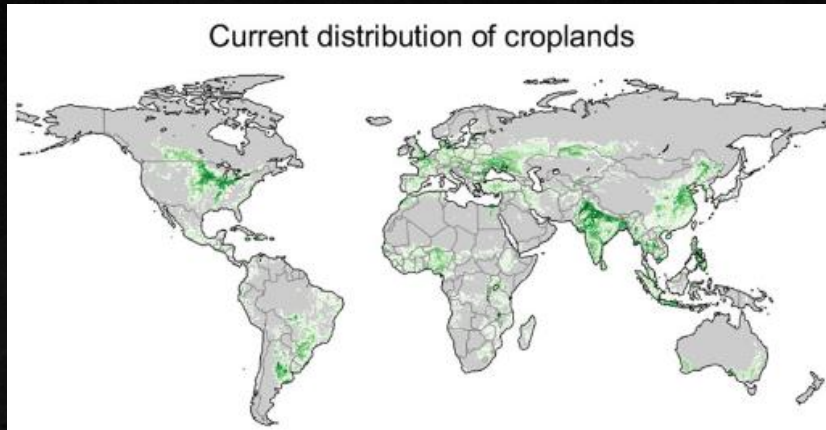


Open in Full Screen

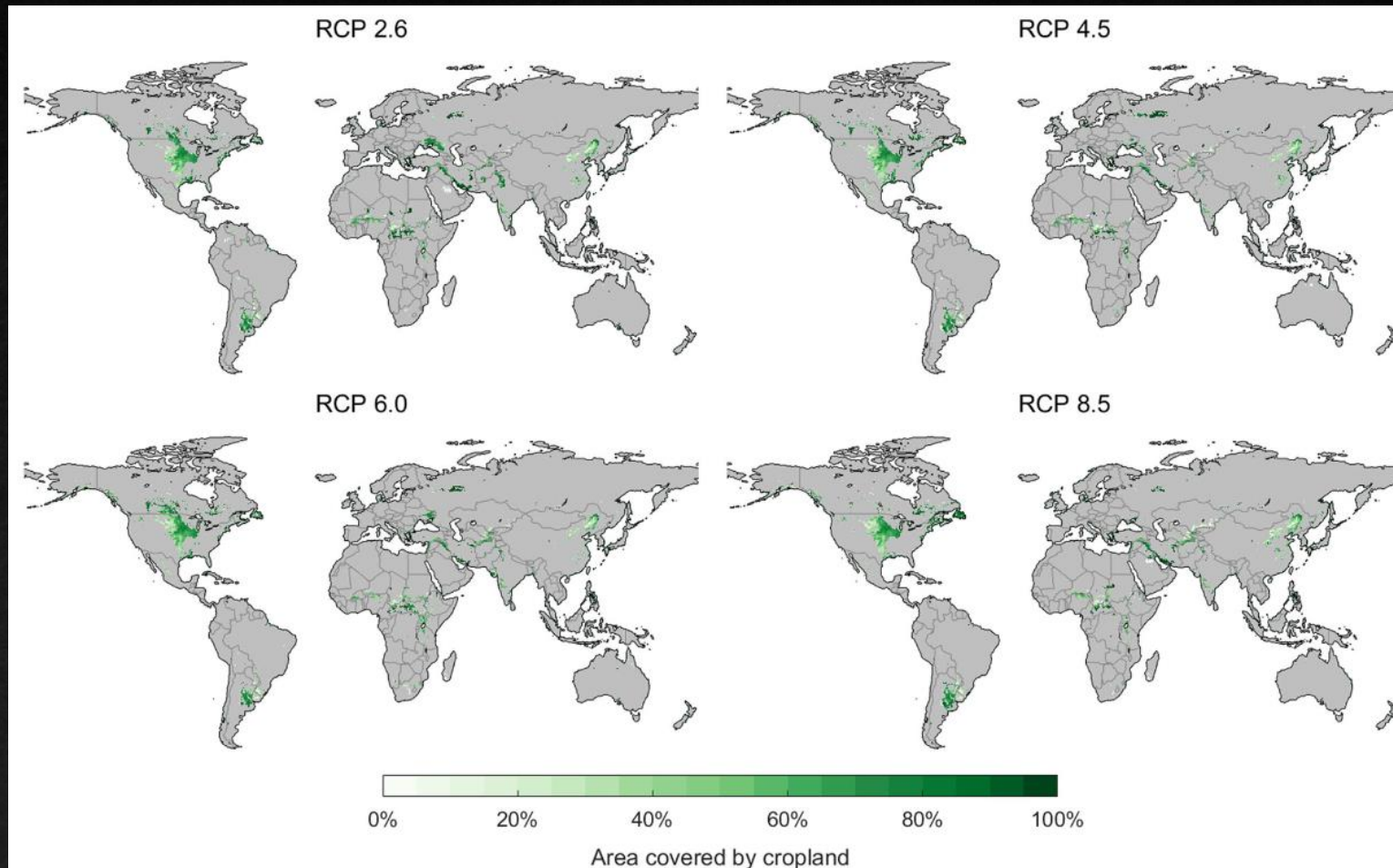
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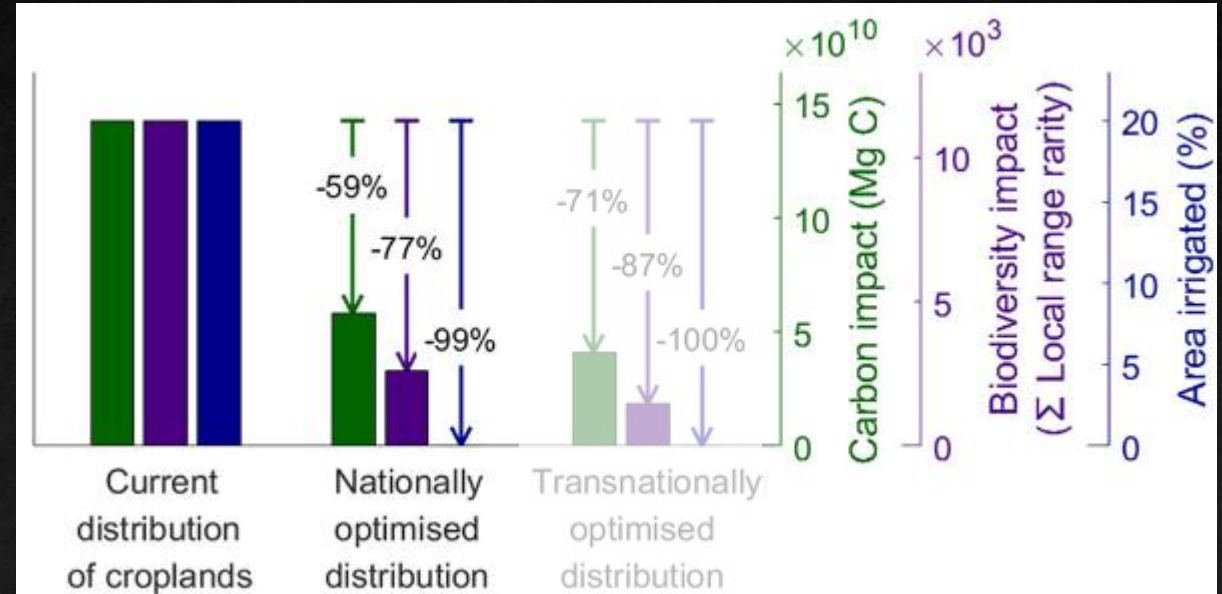
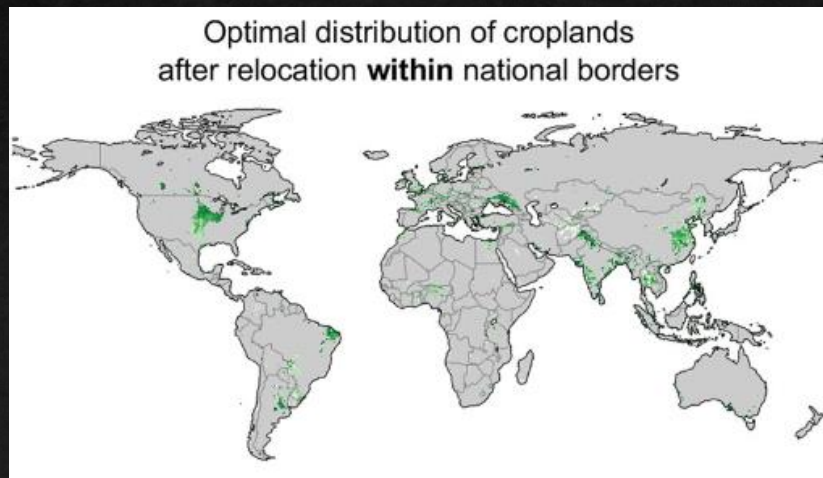
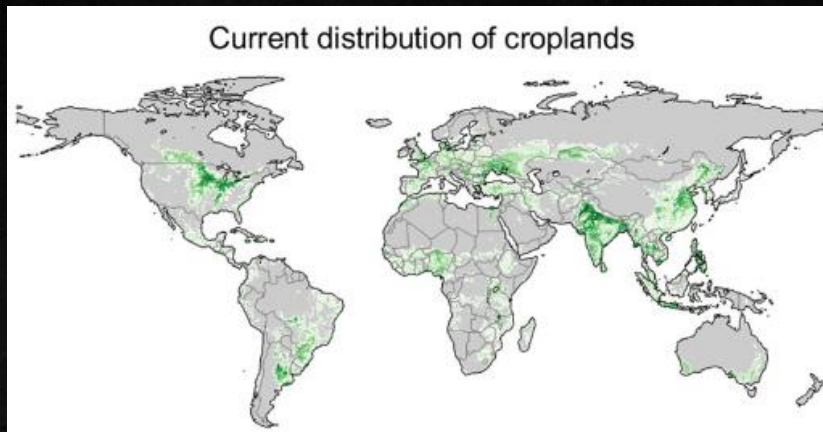
# Optimal global cropland distribution



# Optimal global cropland distribution – future climate

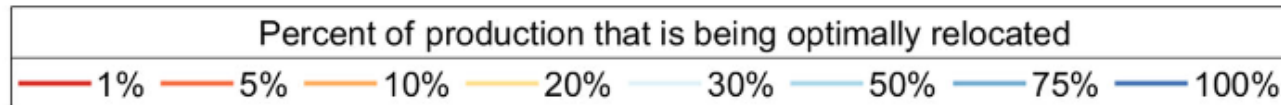
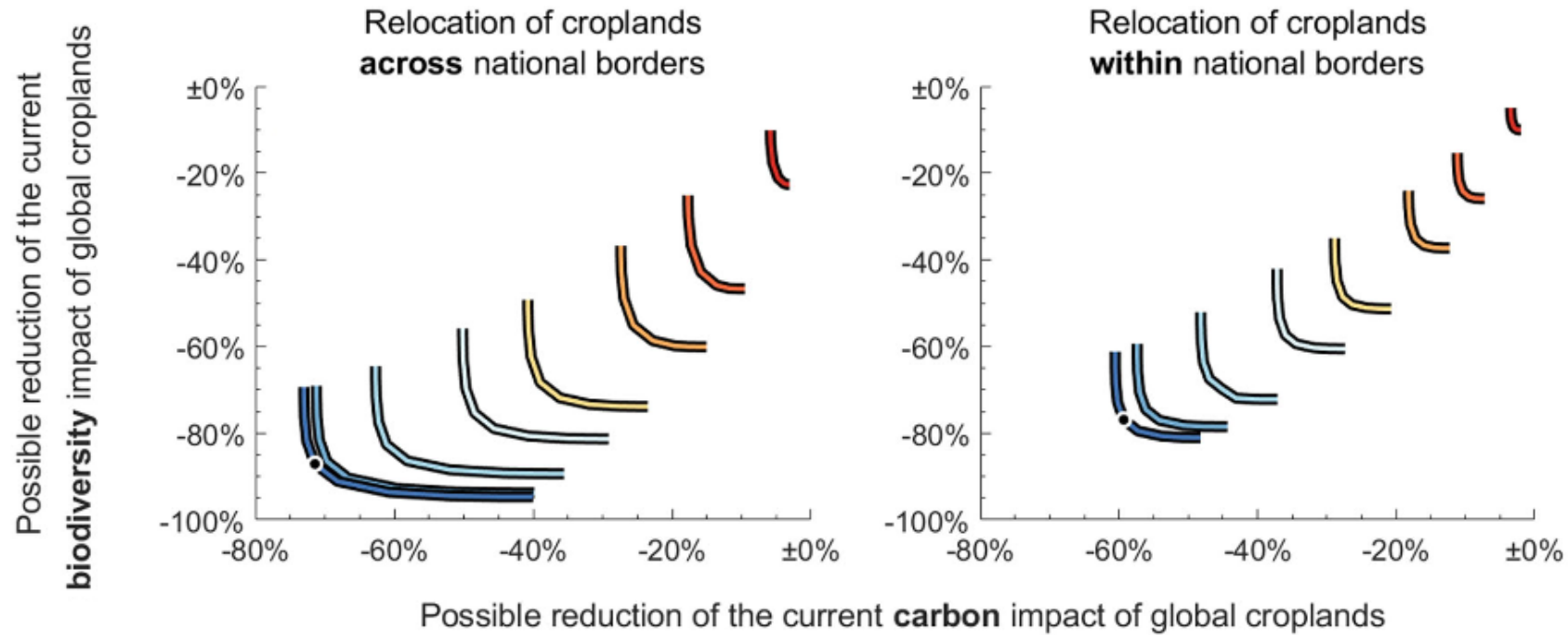


# Optimal global cropland distribution – national relocation

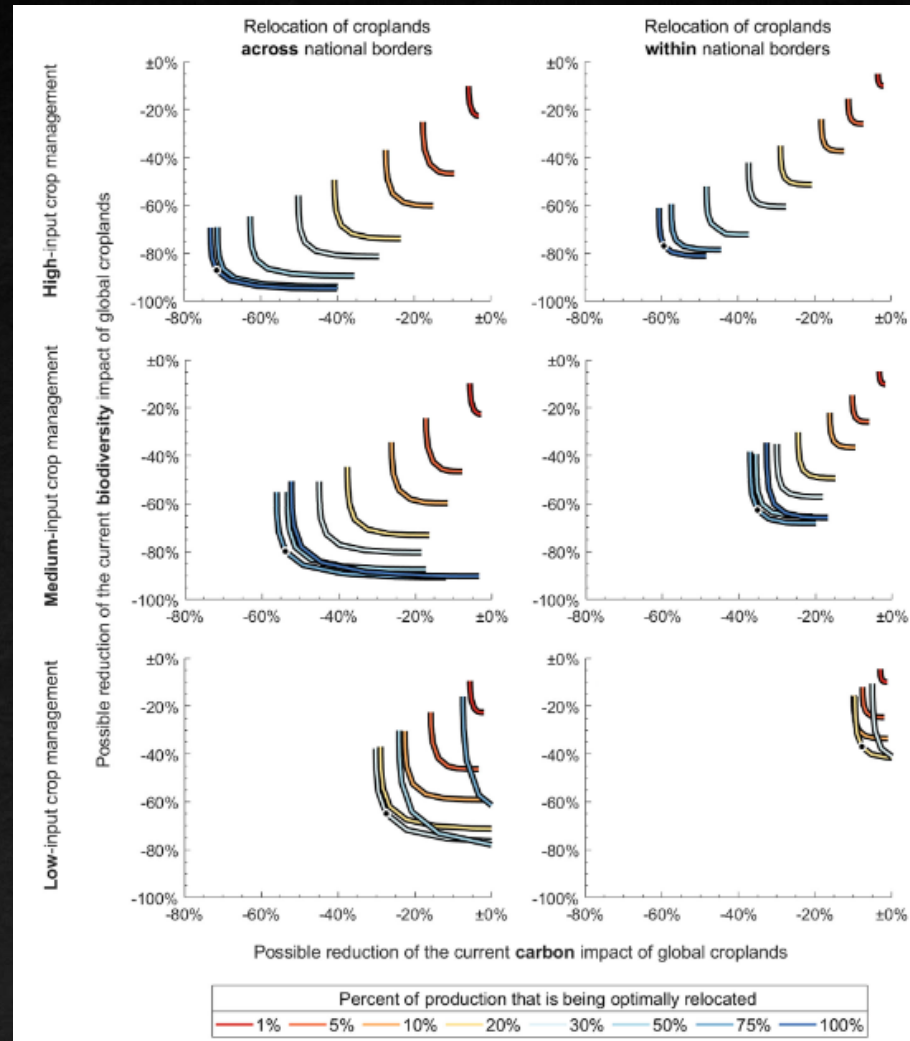




# Partial relocation



# Partial relocation – less intensive management



## Policy aspects





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Thank you!

Robert Beyer

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