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INSTITUTE ON THE
ENVIRONMENT

UNIVERSITY OF MINNESOTA

Driven to DiscoverSM



Agriculture is *Central* to Several Global Challenges

#1. Global Food Security

7 Billion People

1 Billion Food Insecure

#2. Meeting Future Demands

Explosive Population Growth...



More Meat...

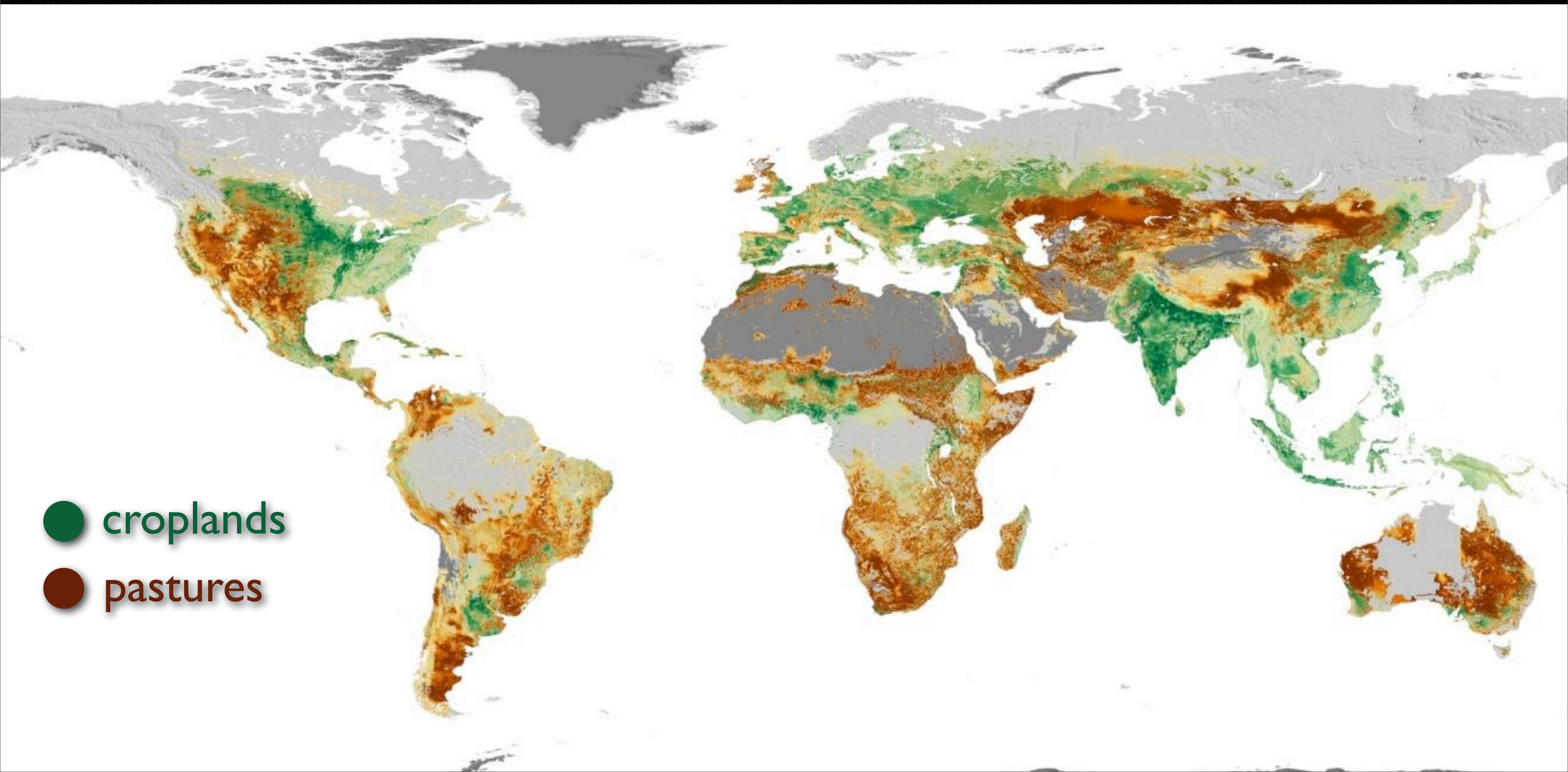


~2x

by 2050

#3. Planetary Sustainability

Farming the Planet...



Farming the Planet...





Mining Watersheds...

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~70% of global water withdrawals...
~80-90% of global water consumption...

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~70% of global water withdrawals...
~80-90% of global water consumption...

Largest source of water pollution...
to lakes, rivers and coastal oceans...

Changing the Atmosphere...



Changing the Atmosphere...

~30% of GHG emissions...

All of These Challenges
Must be Addressed

At the Same Time...

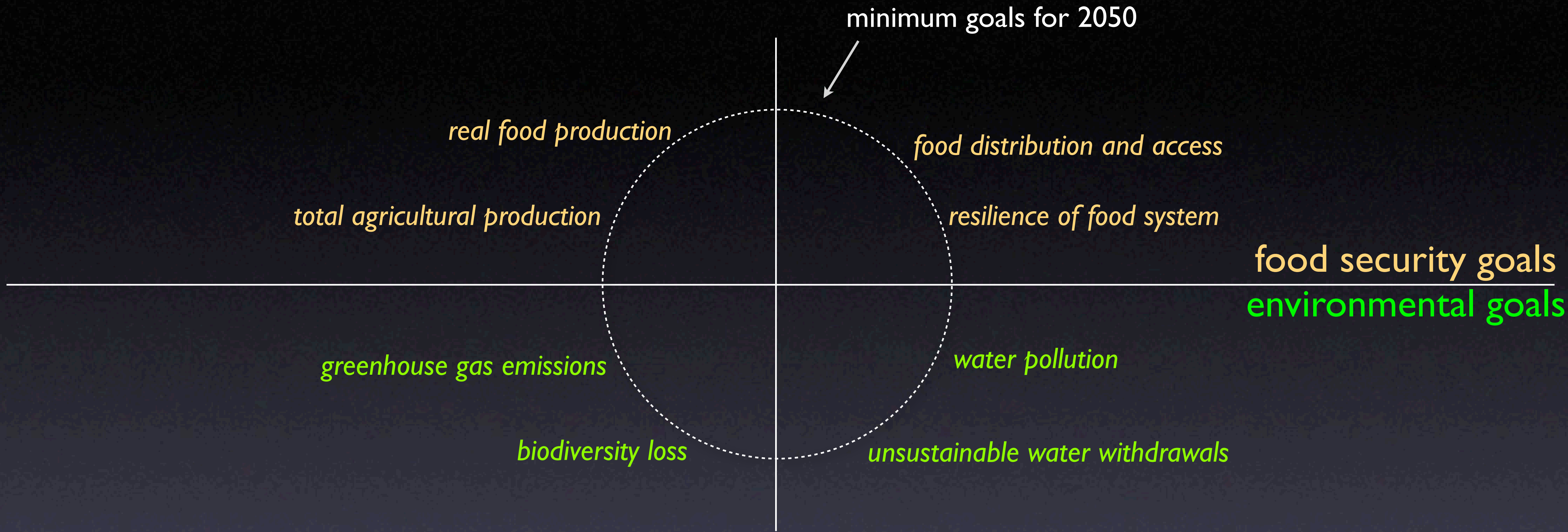
Current Approaches Are...

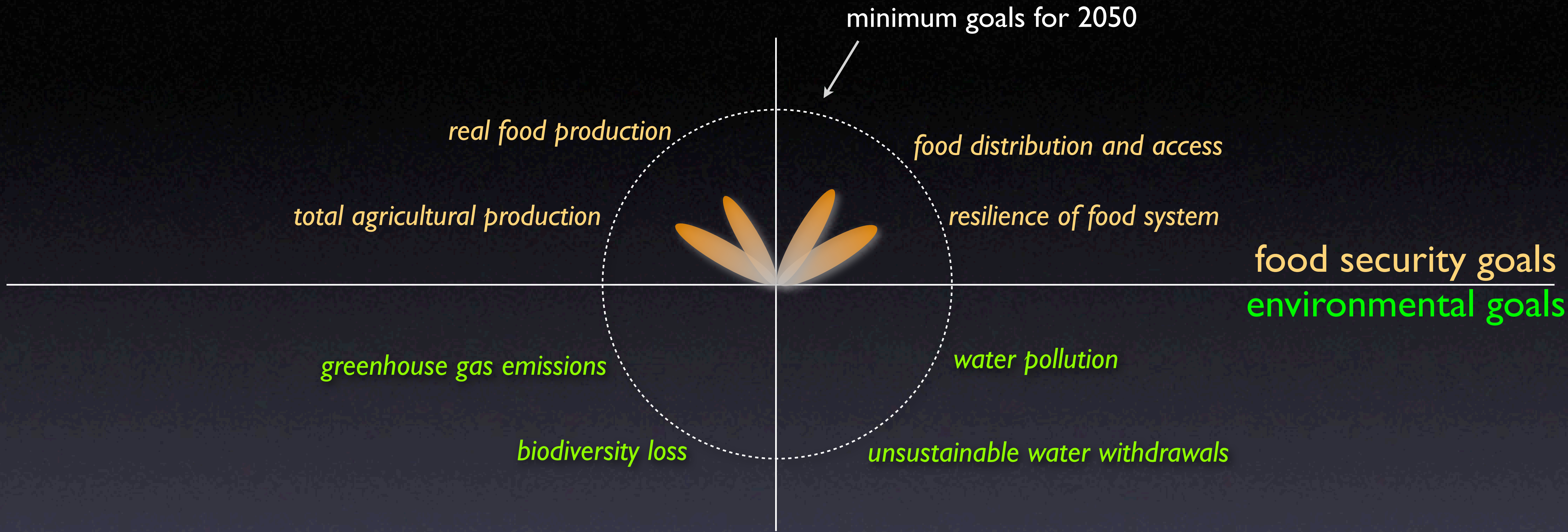
Not Improving Food Security...

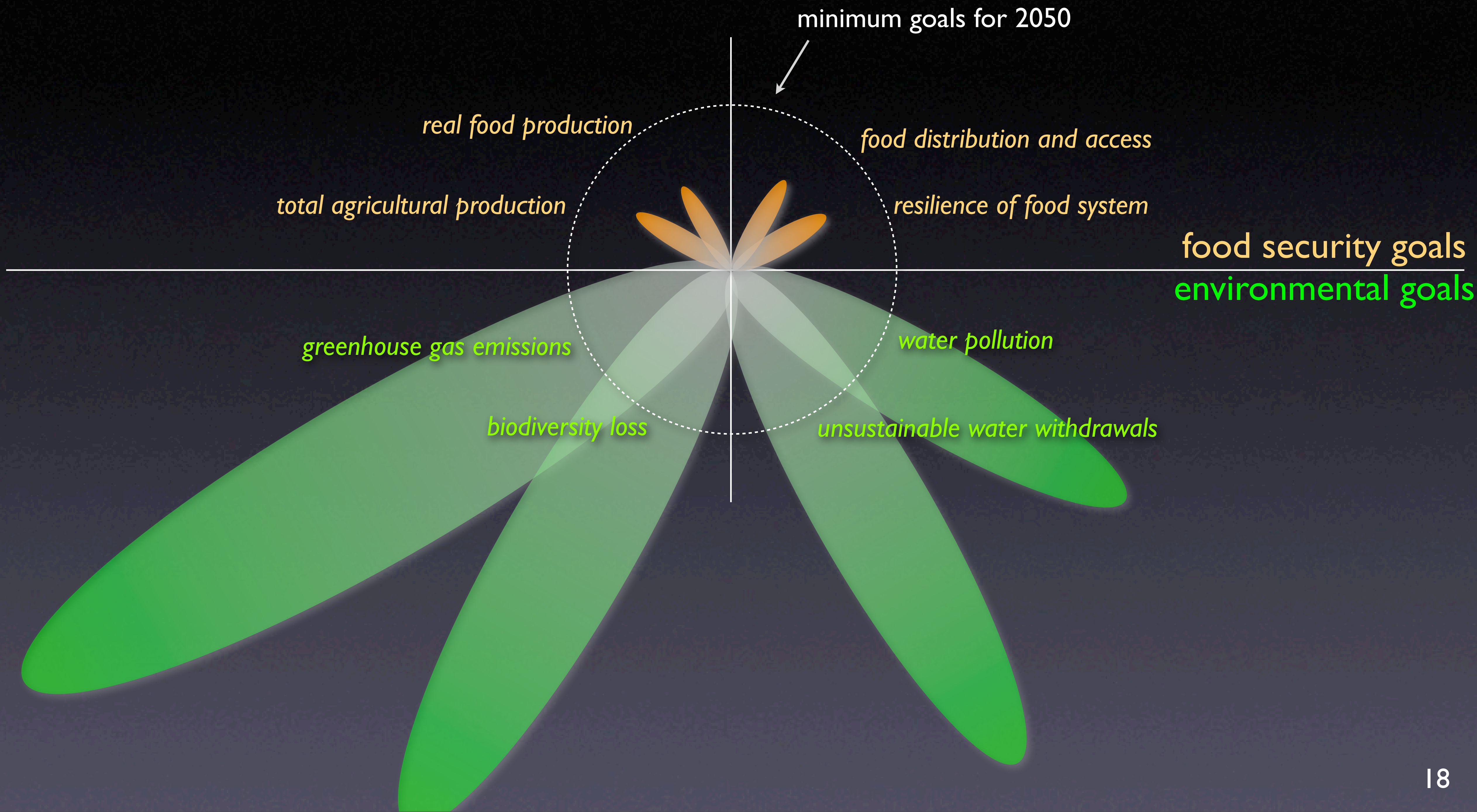
Not Keeping Pace with Demand...

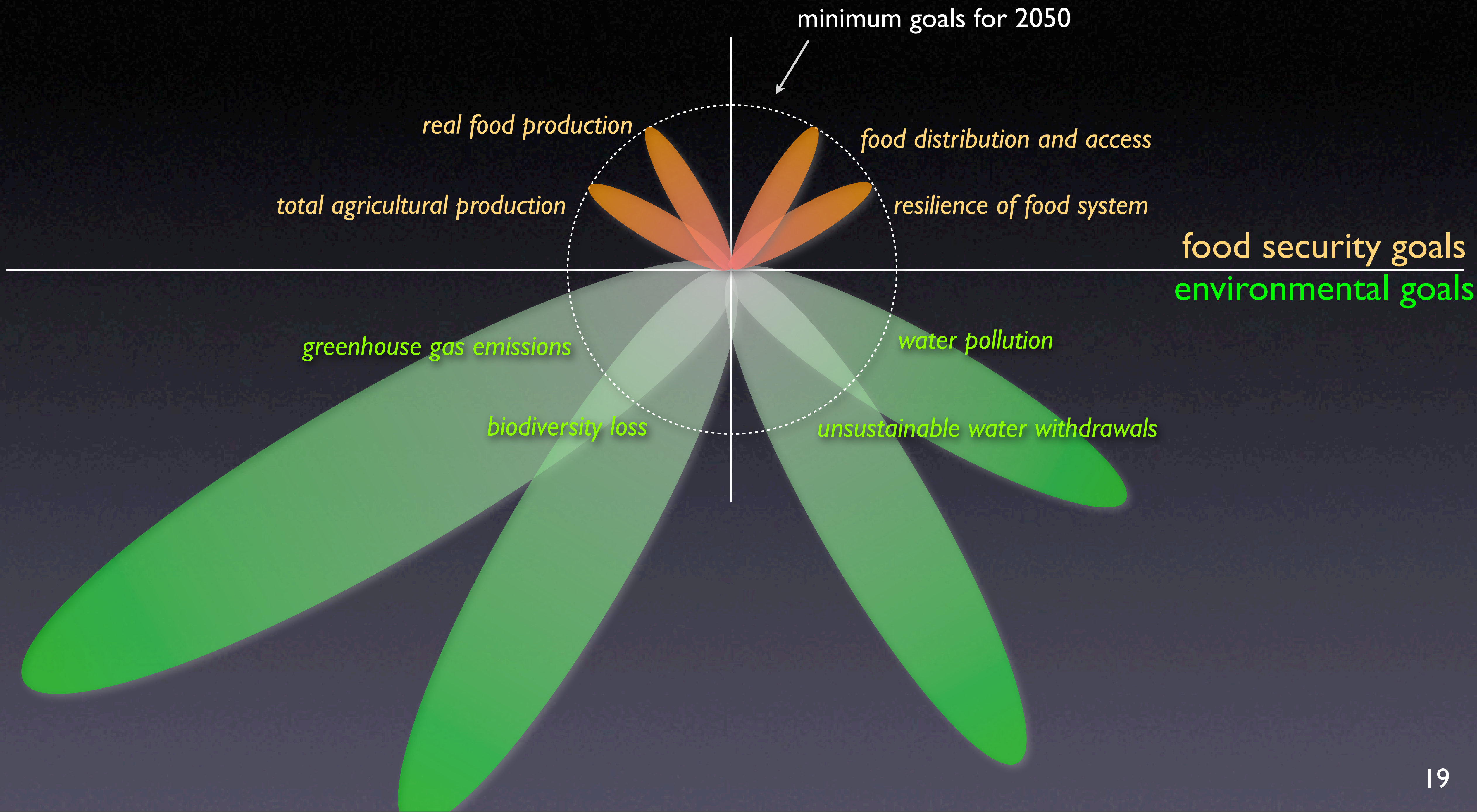
Not Environmentally Sustainable...

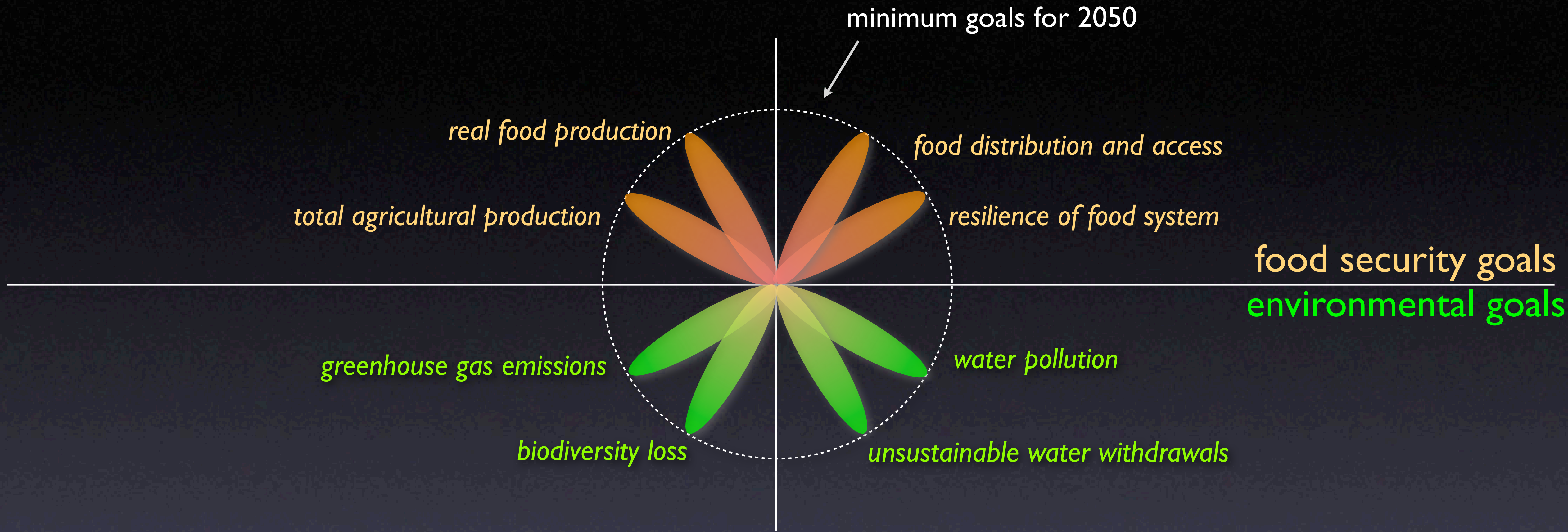
Not Going to
“Grow Our Way Out”
of Problem











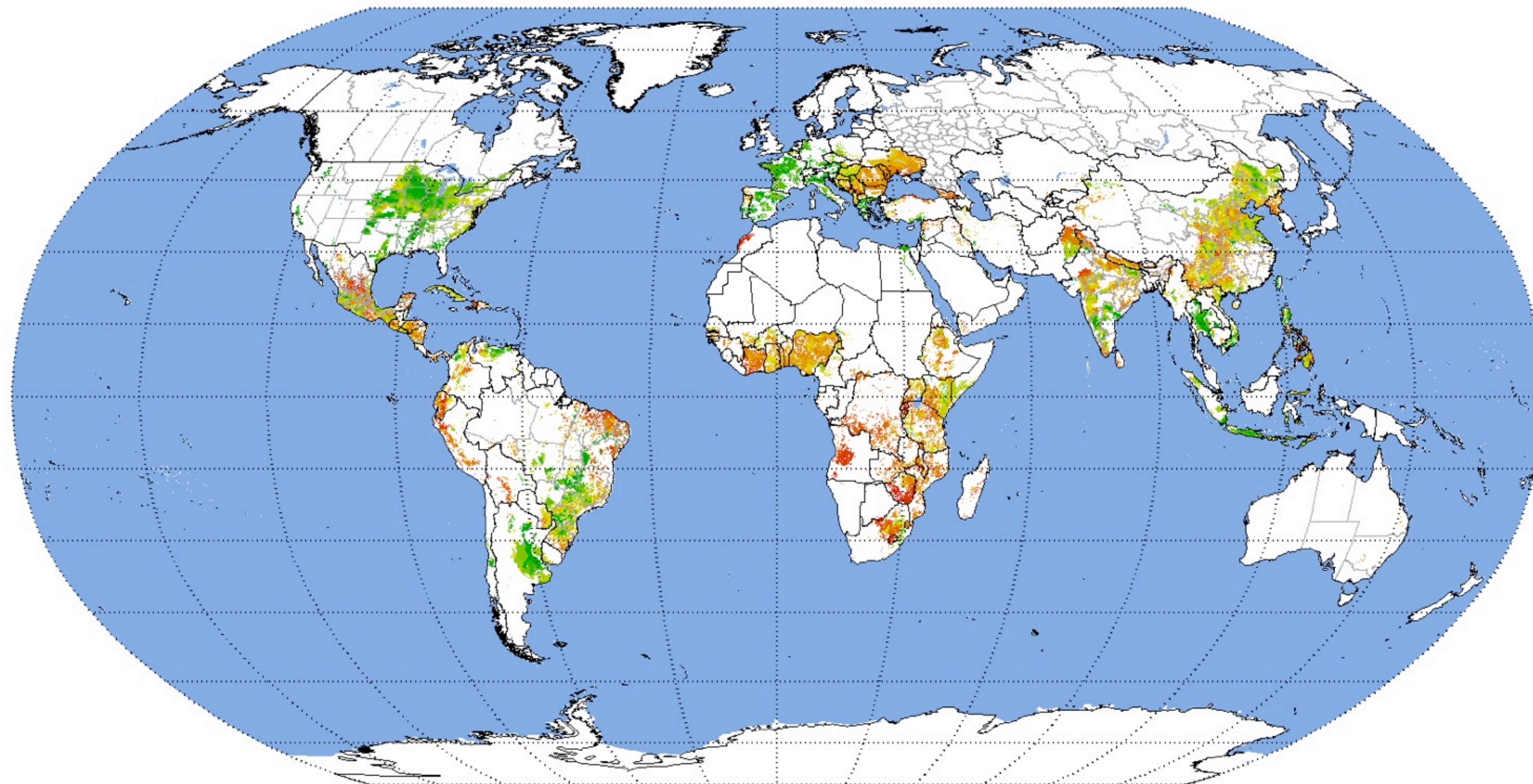


**We Must Look at
Other Possibilities**

Slow Deforestation

Deliver More Food on *Existing* Land

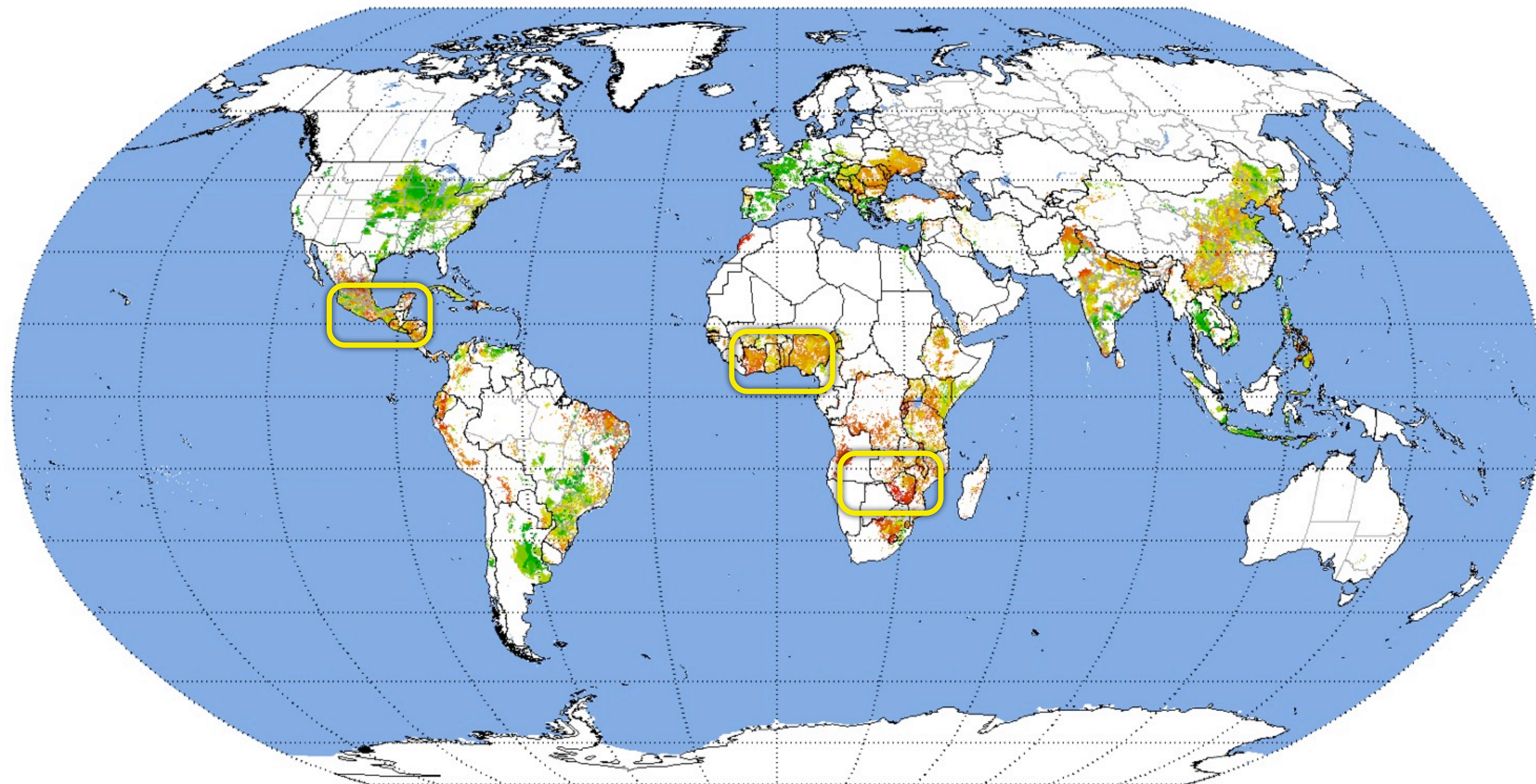
maize yield attainment



percent of potential yield attained



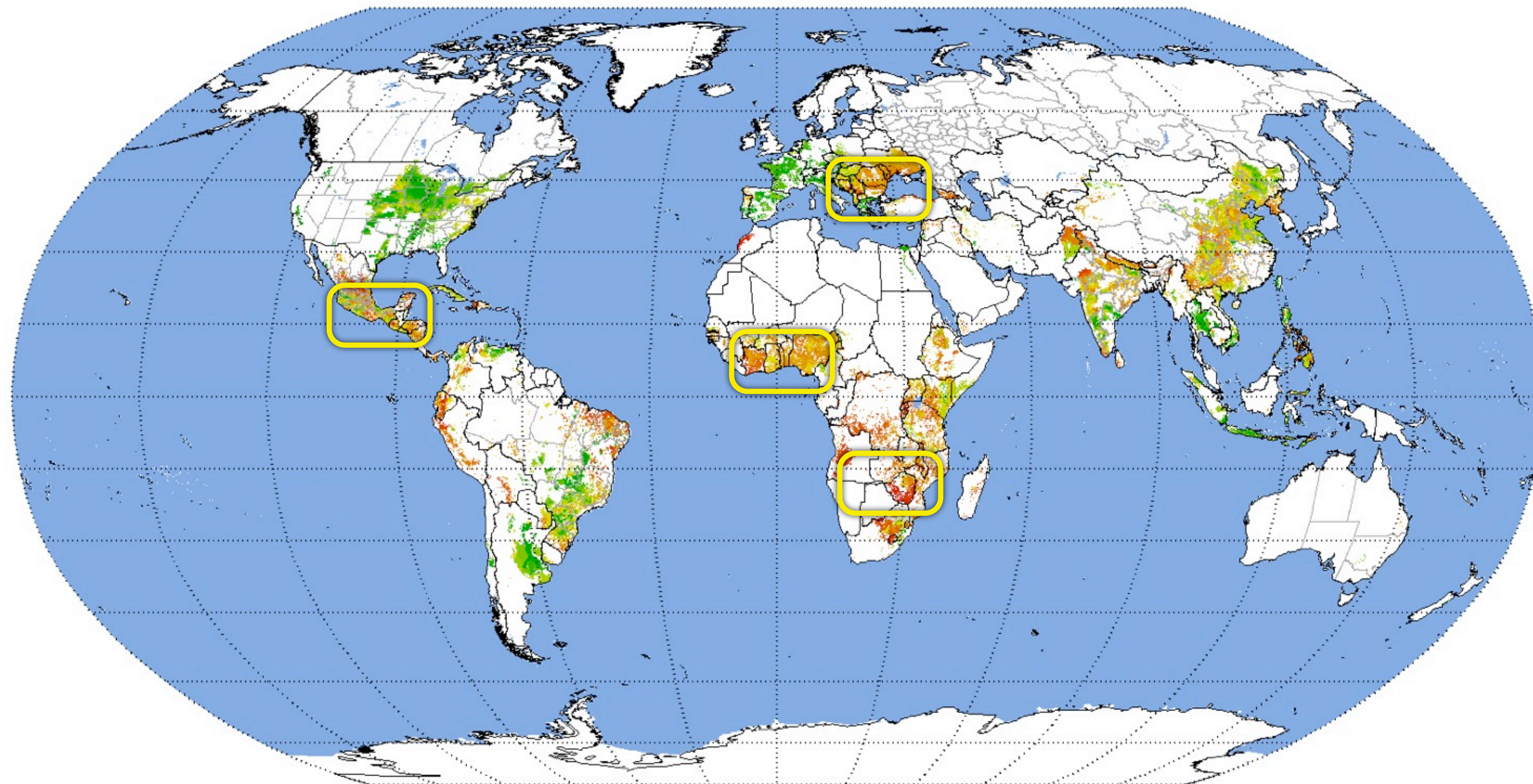
maize yield attainment



percent of potential yield attained



maize yield attainment



percent of potential yield attained



**Deliver More Food with
Less Water, Fewer Chemicals**

Rethink Diets & Biofuels

Reduce Food Waste

Grain Conversion Efficiency



Kilocalorie
conversion
efficiency

40%

22%

12%

10%

3%

Protein
conversion
efficiency

43%

35%

40%

10%

5%

Grain Conversion Efficiency



Kilocalorie
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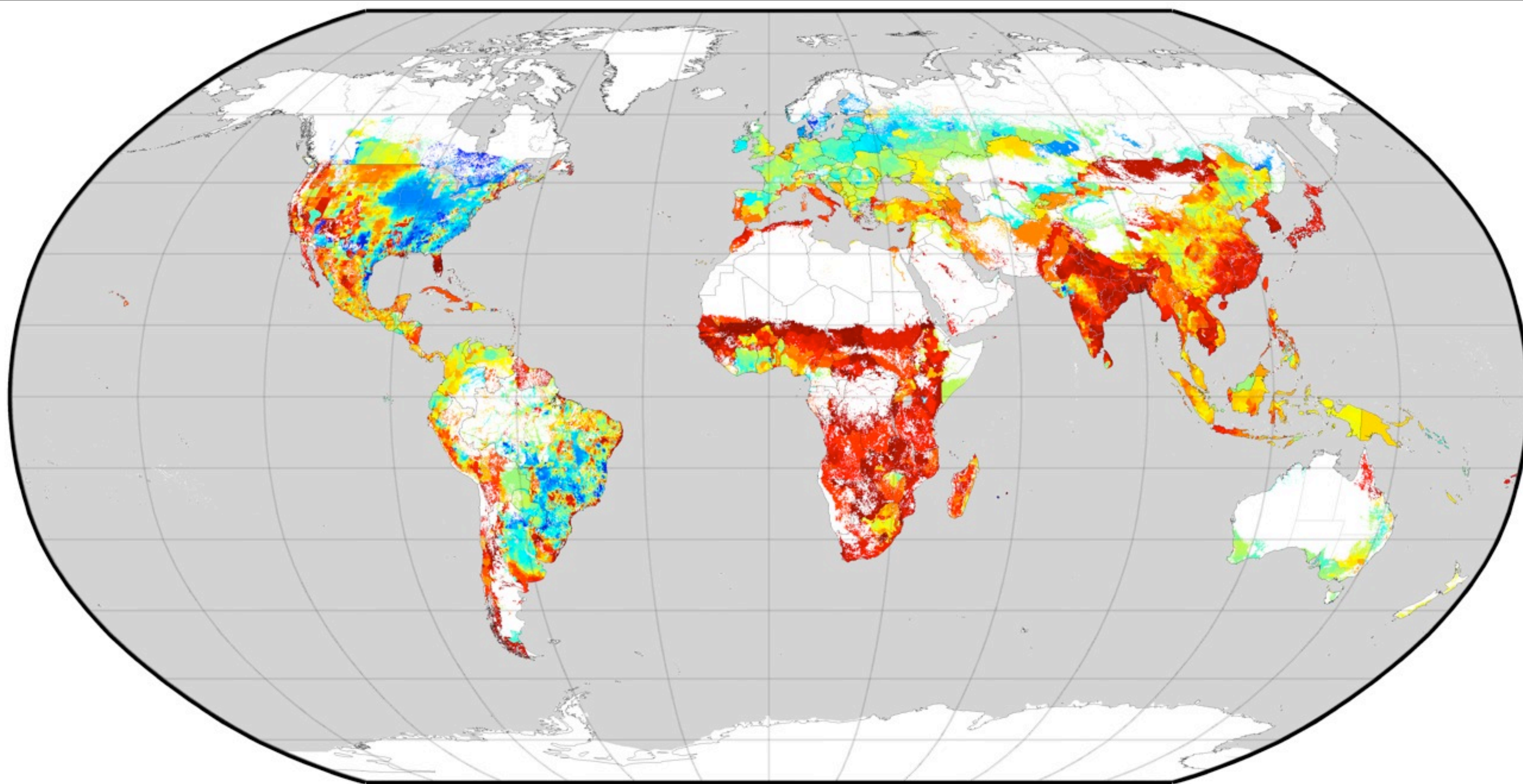
43%

35%

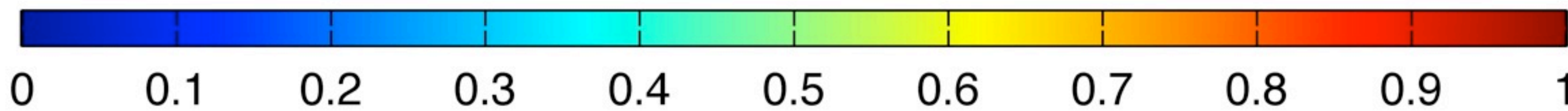
40%

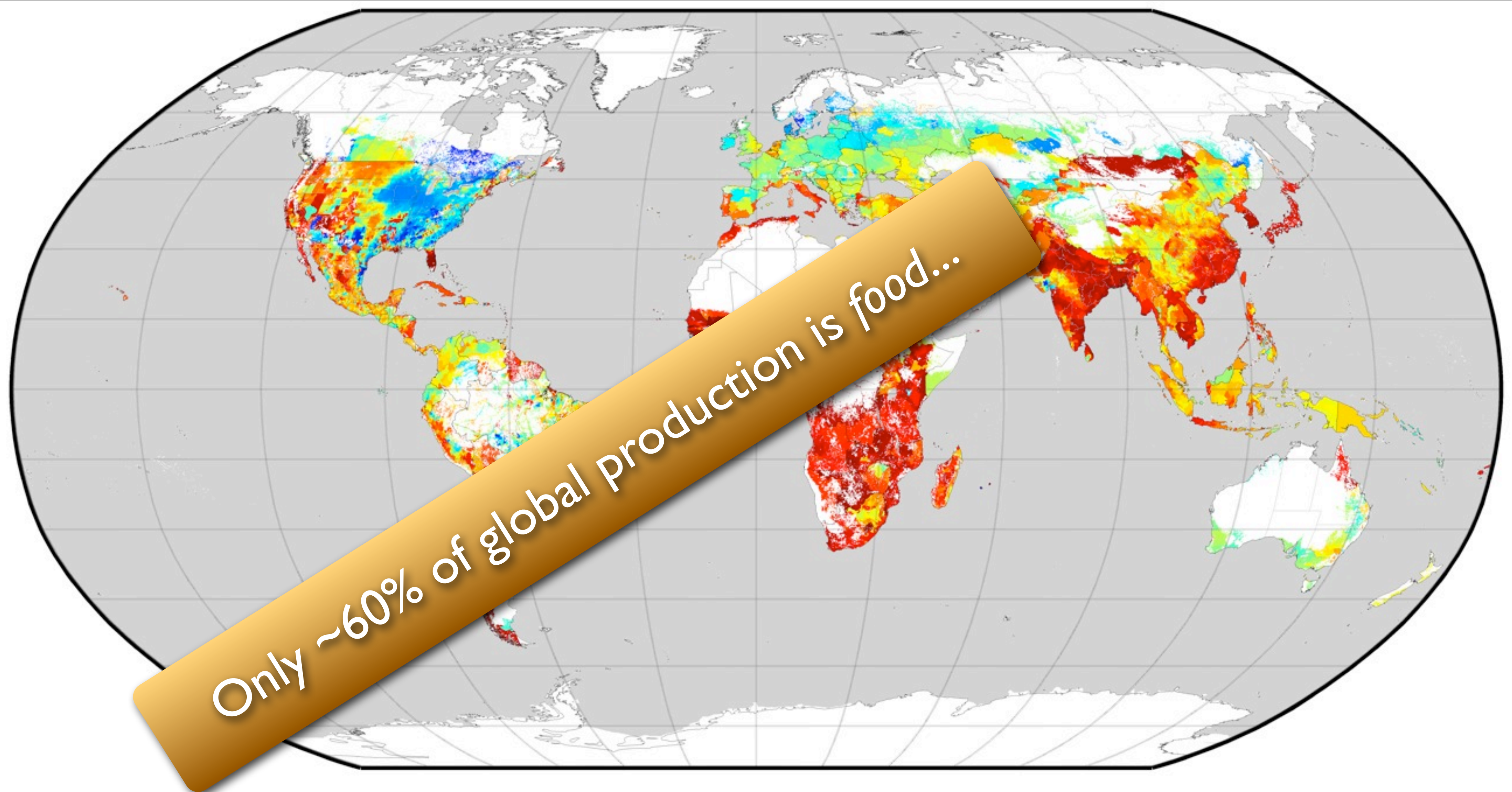
10%

5%



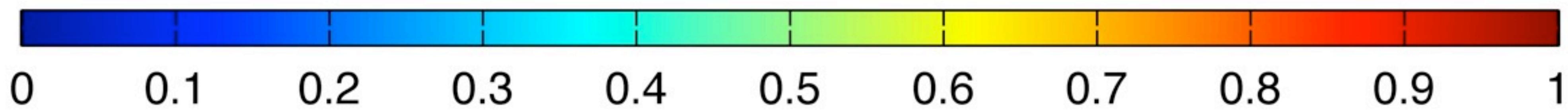
food production fraction

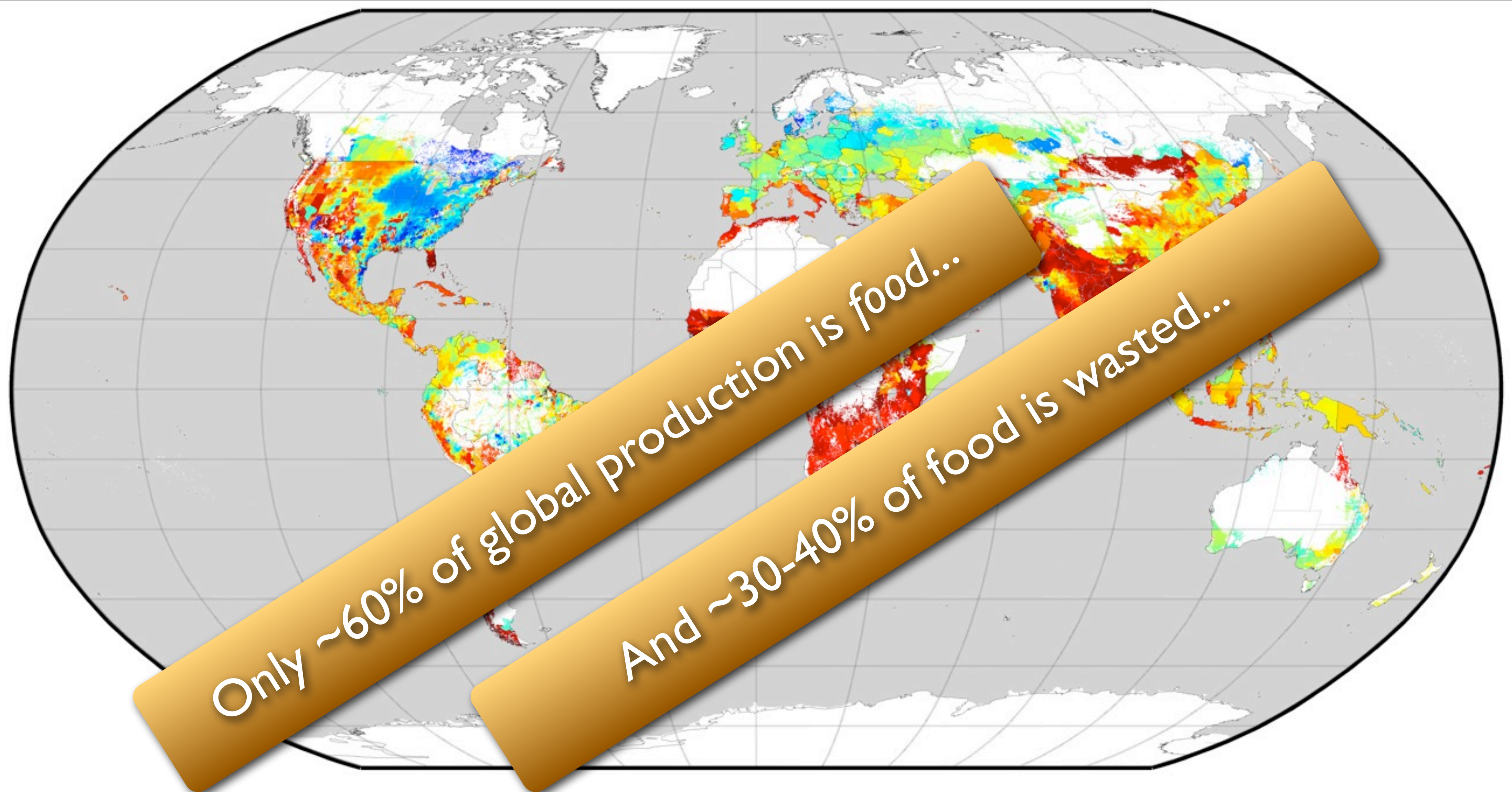




Only ~60% of global production is food...

food production fraction

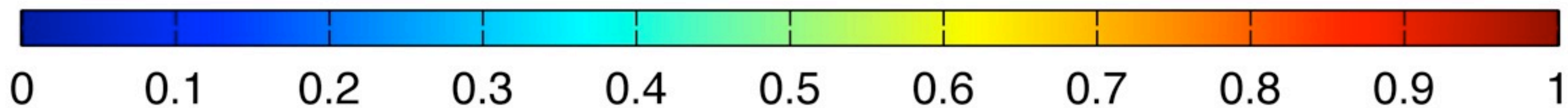





Only ~60% of global production is food...

And ~30-40% of food is wasted...

food production fraction



The background of the slide is a close-up photograph of a rock surface covered in ancient petroglyphs. The rock is a warm, reddish-brown color. Several petroglyphs are visible, including a large, stylized handprint in the upper right quadrant and a circular symbol in the lower left. The text is overlaid on this background.

We Can Feed the World and Sustain the Planet

*But Not With
Business as Usual...*

*But Not With
Business as Usual...*

*We Need New
Approaches*

Toughest Issues of the 21st Century

We Have to it Get it Right

To Help Us Today,
A Great Panel

Howard-Yana Shapiro

Mars, Inc.

Suzanne Ehlers

Population Action International

Patricia Majluf

Center for Environmental Sustainability (CSA)

Cayetano Heredia University, Peru

Thank You

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