Intellectual Community Planning Grant

Food, Climate and Sustainability

Duke World Food Policy Center
Presentation
Goals

1. Start developing shared language around food systems

2. Summarize how the relationship between climate and food systems has been explored in literature

3. Start thinking about how this diverse group can collaborate
A Food System Framework

Source: Niles et al. 2017
Why food and climate?

The connections between food and climate are bi-directional, complex and many.

We need to feed more people a nutritious diet, and we face the additional and growing challenges posed by climate change.
Key Issues in the Food-climate Space

Part 1: Impacts of food on the climate

Part 2: Impacts of climate change on food

Part 3: Social impacts of food-climate interactions
PART 1

Impacts of Food on the Climate

4 key sources of emissions + FW
Global GHG Emissions from Food Production

Source: Poore & Nemecek 2018
Food Waste

3 in 10

Food produced is lost or wasted

9%
of global GHG emissions can be linked to lost/wasted food

Source: UN EP & UN FAO
Impacts of Climate Change on Food

PART 2

1. Reduction in crop yields
2. Decline in nutritional value
Observed Reductions in Crop Yields

<table>
<thead>
<tr>
<th>Region</th>
<th>Agricultural total factor productivity</th>
<th>Major crop species</th>
<th>Crop categories</th>
<th>All crops</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Maize</td>
<td>Wheat</td>
<td>Soybean</td>
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<tr>
<td></td>
<td></td>
<td>Cereals</td>
<td>Vegetables</td>
<td>Legumes</td>
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<td></td>
<td></td>
<td>Leafy crops</td>
<td>Soft fruit</td>
<td>Fruits</td>
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<tr>
<td></td>
<td></td>
<td>Root crops</td>
<td>Tree fruits</td>
<td>Nuts</td>
</tr>
<tr>
<td>Northern Africa</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>Sub-Saharan Africa</td>
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<tr>
<td>Western Asia</td>
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<td>Southern Asia</td>
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<td>South-eastern Asia</td>
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<td>Central Asia</td>
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<tr>
<td>Eastern Asia</td>
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<tr>
<td>Australia and New Zealand</td>
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<tr>
<td>Latin America and the Caribbean</td>
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<tr>
<td>Eastern Europe</td>
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<tr>
<td>Western Europe</td>
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<tr>
<td>Northern America</td>
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<tr>
<td>Global (average of regional data)</td>
<td>-</td>
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</tbody>
</table>

**Impact level**
- Positive
- Negative
- Mixed

**Confidence level**
- Low
- Medium
- High

Source: IPCC AR6 Figure 5.3
# Nutritional Decline in Some Crops

<table>
<thead>
<tr>
<th></th>
<th>Wheat</th>
<th>Rice</th>
<th>Field Peas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>-9%</td>
<td>-3%</td>
<td>-7%</td>
</tr>
<tr>
<td>Iron</td>
<td>-6%</td>
<td>-5%</td>
<td>-4%</td>
</tr>
<tr>
<td>Protein</td>
<td>-7%</td>
<td>-8%</td>
<td>-2%</td>
</tr>
</tbody>
</table>

Source: Myers et al. 2014
PART 3

Social Impacts of Food–climate Interactions

Source: Hebinck et al. 2021
Food Security: Populations Most at Risk

"About 80% of the global population most at risk from crop failures and hunger from climate change are in Sub-Saharan Africa, South Asia, and Southeast Asia, where farming families are disproportionately poor and vulnerable."

Source: World Bank
FOOD SYSTEMS TRANSFORMATION
Discussion Qs

Did today’s introductions or discussions spark any new connections for you in terms of work that we could pursue as a group?

Where do you see your work or interests reflected most in the food system framework?

What further angles of the food-climate nexus are important to address?
Next Gathering

Develop a research agenda for our collaboration

March 22
1 PM

Sanford 201
Bibliography


“Will the World’s Breadbaskets Become Less Reliable?” n.d.

