Why and How to transition cereal systems from problem to solution to the climate change challenge

Dr. Hans R. Herren
President Millennium Institute
Founder & Chairman of Biovision Foundation

hh@millennium-institute.org
“Business as usual is not an option” (IAASTD 2009)
Hunger-poverty nexus; inequity, conflicts, migrations
Today, a world of overproduction and waste
Biodiversity loss; Energy waste; Climate change
The main solutions: Quick fix less genetic diversity? “Its in the Seed”
Green House Gases.....

- Methane from cattle enteric fermentation
- Manure
- Nitrous oxide from fertilised soils
- Fertiliser production
- Biomass burning
- Rice production
- Farm machinery
- Irrigation

- CH₄
- CH₄ + N₂O
- N₂O
- CO₂ + N₂O
- CO₂
- CH₄

Total emissions:
- CH₄: 1792
- CH₄ + N₂O: 413
- N₂O: 2128
- CO₂ + N₂O: 410
- CO₂: 672
- CH₄: 616
- CO₂: 158
- CO₂: 369

Total: 4,832
Replacing nature with business

GMOs
Reaching the planetary boundaries
Why sustainable agriculture?

Sustainable agriculture is key for sustainable development.
The Solution

A fundamental shift in Agricultural Knowledge Science and Technology and agri-food system policies, => institutions => capacity development => investments

Paradigm change: transition to agroecology: sustainable / ecological / regenerative agriculture addressing the multi-functionality and resilience needs of small-scale and family farmers (agroecology vs Climate Smart Agriculture)

Need to use a systemic and holistic approach / National multistakeholder assessments (IAASTD/Rio+20 - SDGs/CFS)
The 3 dimensions of sustainable development

- **Economic**: 
  - Income
  - Marketing
  - Trade

- **Environment**: 
  - Soils
  - Water
  - Climate
  - Biodiversity

- **Social**: 
  - Gender
  - Tradition
  - Culture

- **Governance**: 
  - Recognition
  - Diversified land use

The diagram illustrates the interconnection between economic, social, and environmental dimensions, emphasizing the need for a balanced approach to sustainable development.
The transformation requires also a new diet
From problem to so(i)lution
The carbon underground
Using nature’s services (ecosystem services)
...more so(i)lutions
The transformation is possible.....
.....with only 1/3 of global ag subsidies ($140Bn/year)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit</th>
<th>Baseline</th>
<th>BAU</th>
<th>Green</th>
<th>BAU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural</td>
<td>Bn US$/year</td>
<td>1'921</td>
<td>2'852</td>
<td>2'559</td>
<td></td>
</tr>
<tr>
<td>Crops</td>
<td>Bn US$/year</td>
<td>629</td>
<td>996</td>
<td>913</td>
<td></td>
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<tr>
<td>Employment</td>
<td>M people</td>
<td>1'075</td>
<td>1'703</td>
<td>1'656</td>
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<tr>
<td>Soil quality</td>
<td>Dmnl</td>
<td>0.92</td>
<td>1.03</td>
<td>0.73</td>
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<tr>
<td>Water use</td>
<td>Km/year</td>
<td>3'389</td>
<td>3'207</td>
<td>4'878</td>
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<tr>
<td>Land</td>
<td>Bn ha</td>
<td>1.2</td>
<td>1.26</td>
<td>1.31</td>
<td></td>
</tr>
<tr>
<td>Deforestation</td>
<td>M ha/year</td>
<td>16</td>
<td>7</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Calories for consumption</td>
<td>Kcal/person/day</td>
<td>2'081</td>
<td>2'524</td>
<td>2'476</td>
<td></td>
</tr>
</tbody>
</table>

The transformation is possible.....
.....with only 1/3 of global ag subsidies ($140Bn/year)
Changing Course in Global Agriculture (or any sector) through informed policies and M&E.
Changing Course in Global Agriculture (or any sector)
Changing course in global agriculture

Global Level

CFS: Sharing of experiences and facilitation of assessments

SDGs: Post-2015 Processes

National Level

Multi-stakeholder assessments of sustainable food production and food security

Action and Policies conducive to implement sustainable agriculture
Thank you

You cannot solve the problem with the same kind of thinking that created the problem

Albert Einstein