Ceres2030
Sustainable Solutions to End Hunger
Ending Hunger: What would it cost? [2016]

- We are **not** on track for SDG2
- But we can reach it if we
  - Have more resources
  - Use better interventions
  - Realign priorities
To build consensus on the interventions needed to end hunger and transform the lives of the world's poorest farmers—while protecting the environment.

Our mission
We combine state-of-the-art modelling techniques with expert evidence to support a donor roadmap to achieve SDG 2 (focusing on targets 2.1, 2.3 and 2.4)

Our strategy
How do we develop rigorous evidence?
Our framing question

The HLPF reported a dearth of evidence for SDG 2.3 and 2.4 in a review of SDG 2 in 2017.

Ceres2030 conducted a scoping study to evaluate this claim and finds similar results.

![Systematic reviews & meta analyses by indicator](chart)

- SDG 2.3: 110 studies
- SDG 2.4: 105 studies
- Both 2.3 and 2.4: 64 studies
- Neither 2.3 and 2.4: 37 studies
What does the research baseline look like?
What does the research baseline look like?

<table>
<thead>
<tr>
<th>Topic #1</th>
<th>farmer, extensive, information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic #2</td>
<td>soil, property, erosion</td>
</tr>
<tr>
<td>Topic #3</td>
<td>breeding, trait, genetic</td>
</tr>
<tr>
<td>Topic #4</td>
<td>climate, change, adaptation</td>
</tr>
<tr>
<td>Topic #5</td>
<td>service, ecosystem, biodiversity</td>
</tr>
<tr>
<td>Topic #6</td>
<td>dairy, cow, India</td>
</tr>
<tr>
<td>Topic #7</td>
<td>water, groundwater, basin</td>
</tr>
<tr>
<td>Topic #8</td>
<td>food, security, insecurity</td>
</tr>
<tr>
<td>Topic #9</td>
<td>genetic, marker, polymorphism</td>
</tr>
<tr>
<td>Topic #10</td>
<td>land, tenure, change</td>
</tr>
</tbody>
</table>
What do we mean by evidence?

- Meeting the SDGs requires “better” evidence
- Intervention effectiveness information is scattered
- Research is abundant
- Many scientists are trained to write research, not evidence
- Clearly defined standards of evidence can help promote common ground and consensus building
Our work

*Nature* will publish 7-10 evidence reviews of “best bets” for SDG 2.3 and 2.4

A global advisory board will guide topic and author selection

Our integrated dashboard combines research across siloes to generate better analytics

Baseline instruments from the cost models will inform intervention topics

Tools like risk of bias assessment and protocols help scientists to contribute evidence

We will generate media and policy relevant materials from the findings
Proactive Engagement strategy (2018)

Science
- May: Policy and Science (Ithaca)
- July: ICAE (Vancouver)
- August: AAEA (Washington)
- August: SDG2 (Wageningen)
- October: Science Policy Forum (South Africa)
- November: IFPRI/FAO (Thailand)

Policy
- September: UNGA (New York)
- September: G20/T20 (Buenos Aires)
- October: CFS (Rome)
- December: AERC Biannual Conference (Kenya)

Donors
- April: SDG2 Roadmap Initiative (Washington D.C)
- September: G7 food security working group (Ottawa)
- October: SDG2 Roadmap Initiative (Rome)
Journal Advisory Board

Belay Begashaw, Sustainable Development Goals Center for Africa (Rwanda)

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Leslie Lipper, Independent Science and Policy Council (FAO) (Italy)

Lindiwe Majele Sibanda, Farmer and Food Systems Champion

Njuguna Ndung’u, African Economic Research Council (Kenya)

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Ruerd Ruben, Wageningen University

Nicola Randall, Harper Adams University (UK)

Maximo Torero, World Bank (USA)

Paul Winters, International Fund Agricultural Development (IFAD) (Italy)

Scott Vaughan, International Institute for Sustainable Development (IISD) (Canada)

Li Xiaoyun, China Agricultural University (China)
Potential questions

What is the impact on crop yields and water use when farmers use ICTs to manage irrigation?

What is the mix of interventions that contribute to poverty reduction while improving market access and off-farm employment opportunities?

What is the impact of early warning climate and famine systems on crop loss and economic resilience?
Existing SDG2 Costing Exercise

- **265 billion**
  - Achieving Zero Hunger (FAO, IFAD, WFP)

- **52 billion**
  - IMPACT (IFPRI)

- **11 billion**
  - MIRAGRODEP (IFPRI-IISD)

- **7 billion**
  - Investment Framework for Nutrition (World Bank)

IFPRI Brief: Quantifying the cost and benefits of ending hunger and undernutrition: Examining the differences among alternative approaches.
Existing SDG2 Costing Exercise

What are the additional transfers and investments needed to end poverty and hunger in all countries by 2030?

265 billion

How much would hunger decrease given investments to achieve target yield increases by 2030?

52 billion

What is the minimum cost to end hunger for vulnerable households in all countries by 2030?

7 billion

What is the minimum cost to meet the World Health Assembly (WHA) goals on reducing undernutrition by 2025?

11 billion

IFPRI Brief: Quantifying the cost and benefits of ending hunger and undernutrition: Examining the differences among alternative approaches
Ceres2030 Model Overview

QUESTIONS

Targets for SDG 2
  2.1 Target
  2.3 Targets
  2.4 Targets
Ceres2030 Model Overview

QUESTIONS

Targets for SDG 2
2.1 Target
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Achieve Goals, Minimize Cost
Ceres2030 Model Overview

QUESTIONS

Targets for SDG 2
2.1 Target
2.3 Targets
2.4 Targets

Achieve Goals, Minimize Cost

OUTPUT

Total Cost
to accomplish SDG 2 targets

Optimal Funding Allocation
by kind of intervention
Existing Interventions

to achieve SDG2*

*Included in the model

- Irrigation
- Extension Services
- Investment Subsidies and Grants
- National & International Agricultural R&D
- Social Safety Nets for Consumers
- Sustainable Farm Support for Producers
- Rural Development and Infrastructure

- Fertilizer Subsidies
- Food Subsidies
- Storage
- Production Subsidies
- Roads
- Post-Harvest Losses Reduction
Comprehensive Modelling

Micro Level

Household Variables
food and nutrition security, agricultural productivity, ...
Comprehensive Modelling

Micro Level

Meso Level

Regional and Sectoral Variables
food prices, wages, water use, ...
Comprehensive Modelling

Micro Level

Household Variables

Meso Level

Regional and Sectoral Variables

Macro Level

International Macroeconomic Variables

International trade linkages, fiscal balance, ...
Comprehensive Modelling

Macro Level

Meso Level

Micro Level

Integrated, multi-level approach

Model: MIRAGRODEP Computable General Equilibrium with household-level data
Selecting Indicators for Targets

Select indicators that reflect our SDG 2 subgoals...
Selecting Indicators for Targets

Select indicators that reflect our SDG 2 subgoals... given limited consensus on definitions and data.
Monitor and targeted population

- The Hungry
- The Poor
- The Farmer

Where do I belong?
## Selecting Indicators for Targets

<table>
<thead>
<tr>
<th>Subgoals</th>
<th>UN-Proposed Indicators</th>
<th>UN Tier</th>
<th>In Model?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SDG 2.1</strong> End Hunger</td>
<td>Prevalence of Undernourishment</td>
<td>1</td>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td></td>
<td>Well-defined indicator, directly used in model</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Food Insecurity Experience Scale</td>
<td>2</td>
<td><strong>No</strong></td>
</tr>
<tr>
<td></td>
<td>Not used, insufficient data</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SDG 2.3</strong> Smallholder Productivity</td>
<td>Production per Labor Unit</td>
<td>3</td>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td></td>
<td>Used, some limitations</td>
<td></td>
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<tr>
<td></td>
<td>Average Income by Sex and Indigenous Status</td>
<td>3</td>
<td><strong>Yes</strong></td>
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<td></td>
<td></td>
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<tr>
<td><strong>SDG 2.4</strong> Sustainability</td>
<td>% of Agricultural Area that Is Sustainable</td>
<td>3</td>
<td><strong>No</strong></td>
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<tr>
<td></td>
<td>Not defined by UN Alternative indicators used</td>
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### Summary of Indicators

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<td>Household</td>
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SDG 2.4

Adaptation Included in 2.1 and 2.3

Mitigation: GHG Emissions

Social Dimension
No One Left Behind (2.1, 2.3)

Economic dimension
Model rationality

Water Needs Monitoring

Land Use
Fertilizer Use
Energy Use

Water Needs Monitoring

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<td>SDG 2.4 Sustainability</td>
<td>Total GHG emissions in agriculture Fertilizer Use</td>
<td>Energy Use</td>
<td>Land Use + Water Requirements</td>
</tr>
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## From Indicators to Quantitative Targets

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<th>Subgoals</th>
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<tr>
<td>SDG 2.1 End Hunger</td>
<td>Prevalence of Undernourishment</td>
<td>5%</td>
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<td>(X2)</td>
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<td>Productivity</td>
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<td></td>
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<td><strong>Total GHG emissions in agriculture</strong> Fertilizer Use</td>
<td>NDC</td>
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<tr>
<td></td>
<td>Energy Use</td>
<td>Land Use</td>
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Thank you

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