COLUMBIA CLIMATE SCHOOL Food for Humanity Initiative

# The importance of evidence and data to hold a spotlight on food systems

Jessica Fanzo Professor of Climate and Food Director of the Food for Humanity Initiative Columbia Climate School, Columbia University

# Why do we focus on food systems?

### Food systems

#### are *victims* of climate change

#### are *transgressors* of climate change

are *solutions* in mitigating and adapting to climate change

## 1. Climate is impacting food systems and other systems relevant for diets and nutrition



Fanzo, J. C., & Downs, S. M. (2021). Nature Reviews Disease Primers, 7(1), 90.

## 2. Food systems are impacting environmental resources and climate



## 3. Improving diets and nutrition remains challenging across the world

**733 million (9%)** of the world's population are undernourished

**148 million (23%)** children under five years of age are stunted

**45 million (7%)** children under five years of age are wasted

**37 million (5.5%)** children under five years of age are overweight

**2.5 billion** adults are overweight or obese

#### 2.8 billion (35%)

of the world cannot afford a healthy diet

#### 28% (average)

increase in food inflation globally since the pandemic

82% (34 out of 41 countries - 2/3 of the world) do not consume the 5 recommended healthy food groups

**11 million deaths annually (20%)** are linked to poor diets

## 4. Achieving the Paris climate change targets requires multi-level food systems action



Clark, M.A., et al 2020. Science, 370(6517), pp.705-708.

## 5. Resource-constrained settings and vulnerable & marginalized populations need prioritization

Elements of vulnerability & marginalization interacting with social determinants of health

Casual chain of climate drivers to nutrition outcomes



## Food systems are the *lifeline* between climate & nutrition



Our research in the last decade informs our current research portfolios

### **Current Research Focus Areas**

01

Prioritizing and framing food systems in climate and international development global agendas 02

Improving *national* food system decision-making with better food systems science 03

Understanding how *local* foodscapes influence healthy and sustainable diets

## 04

Exploring climateimpacted geographic poverty traps on nutrition outcomes

### **Current Research Focus Areas**

01

Prioritizing and framing food systems in climate and international development global agendas 02

Improving *national* food system decision-making with better food systems science 03

Understanding how *local* foodscapes influence healthy and sustainable diets

04

Exploring climateimpacted geographic poverty traps on nutrition outcomes

## **Area 1:** Prioritizing and framing food systems in climate & international development *global* agendas

- The international development agenda is a crowded, distracted, gatekeeping space.
- Attention towards food security ebbs and flows, but with climate change, wars, & the postpandemic economic downturn, more policymakers are looking to how to "transform food systems."
- This research aims to understand how to ensure food security and systems remain high on the agenda by providing guidance and evidence on their importance for sustainable development.



## **2016 to 2020:** Established the notion of "food systems" and their political relevance for sustainable development



Evidence-based guidelines on appropriate policies, responsible investments and institutional arrangements needed to address sustainable food systems while also addressing economic, social and environmental sustainability issues and impacts.

### **2019 to 2023:** Determined the evidence base and scientific targeting for food system *transformations* for both human and planetary health



transform food systems

blue foods in food systems

boundary scientific targets

case to transform food systems

transform food systems

## Planetary Diet: Significant report on setting scientific targets for diets within planetary boundaries







6 boundaries crossed

Willett et al Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. Lancet. 2019 Feb 2;393(10170):447-492

## Planetary Diet: Significant report on setting scientific targets for diets within planetary boundaries

### nature

Explore content 🗸	About the journal $ \! \!   \!              $	Publish with us $  ightarrow $	Subscribe
nature > news > ar	ticle		

NEWS | 15 April 2024 | Correction 22 April 2024

## Revealed: the ten research papers that policy documents cite most

An exclusive analysis shows that economics and interdisciplinary teams get the attention of policymakers.

Health boundary 153%

9645 citations to date

Willett et al Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. Lancet. 2019 Feb 2;393(10170):447-492

### Lessons at the global level

- If you flood the landscape, you can garner attention. But it is *transient and often temporary*.
- While food systems have reached a higher priority, policymakers often don't know how to navigate such a complex system and are unaware of trade-offs and which levers to invest in. *Providing data* is critical if we want evidence-based decision-making.
- While global governance matters for food systems, there is a need for *national* and *local* context, governance, solutions, and investments if we want communities to reap benefits and adapt.

### **Current Research Focus Areas**

01

Prioritizing and framing food systems in climate and international development global agendas 02

Improving *national* food system decision-making with better food systems science 03

Understanding how *local* foodscapes influence healthy and sustainable diets

04

Exploring climateimpacted geographic poverty traps on nutrition outcomes

### Area 2: Improving *national* food system decisionmaking with better food systems science

- Food system transformation is urgent, requiring rigorous, science-based monitoring to guide public and private decisions and support those who hold decision-makers to account.
- Yet, policymakers are often in the dark on how food systems are performing, potential nearand long-term risks, and where to intervene.
- This research aims to develop global guidance & better data tools, metrics, and models to unpack some of the most complex food systems science issues.





Food Systems Countdown Initiative

Fanzo, J., et al 2020. Nature Food, 1(5), pp.243-246; Fanzo et al 2021. Food Policy, 104, 102163.

### Built a food systems tool to guide diagnosing and decision-making



foodsystemsdashboard.org

Decide

The Food Systems Dashboard gives a complete view of food systems by bringing together data from multiple sources. It's now possible to compare drivers, components, and outcomes of food systems across countries and regions, gain insights into challenges, and identify actions to improve nutrition, health, and environmental outcomes.



Diagnose

### Mapping tool: Analyze indicators in various ways





Food Environments > Food affordability > Relative caloric price (RCP) of Fish - Total

#### Nigeria

Bappenas (Indonesian Ministry of Planning and Development) will assume management of the FSD in June. They will use it for the development of the:

- National Medium-Term Development Plan (RPJMN)
- National Action Plan for Food and Nutrition

Global Data

 And piloted in Jakarta City, Bogor Regency, and Tangerang Regency at local government level

Country Profiles Compare Information

All the subnational dashboards were developed in partnership with relevant ministries and plan to develop diagnose and decide functions

2 Search for Indicator			Tim
→ Drivers	37	~	201
5 Food Supply Chains	45	~	
Food Environments	п	^	
Food availability	(11)	~	
Food affordability	17	^	
Cost of nutrient adequacy (CoNA) as a p household food expenditure - Total	percent of		
Cost of nutrient adequacy (CoNA) at pu parity (PPP) prices for food - Total	echasing pri	ce	
Cost of nutrient adequacy (CoNA) in loc units (LCU) - Total	cal currency		
Cost of recommended diet (CoRD) as a household per capita food expenditure	percent of - Total		



## The Dashboard diagnoses food systems performance



## Monitoring food systems contributes to accountability and action



foodcountdown.org

- The Food Systems Countdown Initiative is a collaborative effort to monitor food system change and performance over the next 8 years.
- Such monitoring can help aligning decision makers around key priorities, incentivize action, hold stakeholders accountable, sustain commitment by demonstrating progress, and enable course-corrections.
- The FSCI is an interdisciplinary collaboration of 65 scientists representing every region of the world from 32 organizations -- Civil Society, Academia and the UN that emerged from the 2021 United Nations Food Systems Summit.

### How the FSCI is organized







Upper middle-income



#### Thematic area 1: Diets, nutrition, and health

#### Prevalence of undernourishment



#### Ultra-processed food sales per person

Consumed all 5 food groups

desirable

Oceania North America and Europe Latin America & Caribbean East Asia North Africa & West Asia Central Asia Southeast Asia Sub-Saharan Africa South Asia

#### Access to safe water



#### Cannot afford a healthy diet (%)

Sub-Saharan Africa Sub-Saharan Africa South Asia South Asia Southeast Asia Central Asia North Africa & West Asia North America and Europe Latin America & Caribbean North Africa & West Asia Central Asia Latin America & Caribbean East Asia Southeast Asia Oceania East Asia North America and Europe Gobal average Gobal average More More Less Less

desirable

#### Zero fruits or vegetables

South Asia Sub-Saharan Africa North Africa & West Asia North America and Europe Latin Amorica & Caribboan



Latin America & Canobean
Southeast Asia
East Asia
Central Asia

Less	Gobal average	More
desirable	,	desirable



desirable

## Lessons from the *national* food systems science level

- No single region of the world has a monopoly on food systems successes or on food systems challenges. Every region has significant room for improvement and countries can learn from each other.
- Without a monitoring system that shows strengths and weaknesses at the national level, country attempts to transform their food systems will lose their bearings and lose their way.
- There are critical data gaps that are preventing to effectively monitor progress of food systems transformation in different dimensions. Efforts and investments should be made in the near term to fill existing data gaps.
- Researchers should ensure these indicators and their data are useful and interpretable by policymakers and other food actors in ways that are relevant for food system decisions and action.

### **Current Research Focus Areas**

01

Prioritizing and framing food systems in climate and international development global agendas 02

Improving *national* food system decision-making with better food systems science 03

Understanding how *local* foodscapes influence healthy and sustainable diets



Exploring climateimpacted geographic poverty traps on nutrition outcomes

## Area 3: Understanding how *local* foodscapes influence healthy and sustainable diets

#### **"Ground-truthing the EAT-Lancet Diet**

- Local foodscapes and environments influence what and where food is grown, biodiversity, and what foods are available and accessible to communities.
- Geopolitics, climate change, urbanization, and population pressures are changing local foodscapes in profound ways that are, in turn, influencing people's access to healthy and sustainable diets.
- This research aims to understand how various localized, contextual factors influence the health and sustainability of diets in communities.



## Investigating the localized drivers that impact access to healthy and sustainable diets in Southeast and South Asia

Geographic Focus: Cambodia, India, Indonesia, Myanmar, Nepal, Sri Lanka, and Vietnam









### Loss of vegetables across supply chains in India



#### Amount of loss at each supply chain level or transport leg, as a % of total vegetables produced

Storage at Transport from Storage at Transport from Storage at Village Markets Wholesalers between Wholesalers Retailers to Wholesalers to Retailers

Spiker, M.L., et al 2023. Food Policy, 116, p.102416.



Typical food consumption patterns

Downs, S.M., et al 2019 Public health nutrition, 22(6), pp.1075-1088.

## Attributes of food groups make a difference in preferences and food choice in peri-urban Vietnam

Attribute	Vegetables	Fruits	<b>Instant foods</b>	Snack foods
Nutrition	100.00	100.00	57.21	100.00
Food safety (immediate)	26.20	35.86	52.22	94.62
Food safety (future)	14.83	97.10	45.23	81.65
Naturalness	35.60	53.45	8.96	11.66
Convenience	12.51	21.38	100.00	56.34
Taste	22.20	86.19	32.23	97.59
Tradition	7.96	8.12	9.09	9.30
Appearance	2.80	5.98	7.70	10.29
Energy	1.12	3.84	17.81	18.78
Price	0.81	2.36	3.75	5.57
Modernity/Novelty	N/A	N/A	7.36	16.60

Food access in rural and peri-urban environments is rapidly changing and influenced by urban centers and their mobility touch points but not equally and everywhere.

Contents lists available at ScienceDirect Appetite Journal homepage: www.slasvier.com/locate/appet ELSEVIER Beyond price and income: Preferences and food values in peri-urban Viet Nam Winnie Bell**, Jennifer Coates*, Jessica Fanzo*, Norbert L.W. Wilson*, William A. Masters*	Balancing a sug climate goals: e Saskia de Pen <sup>1,2</sup> Ridwan H Rebecca Ramsing, <sup>3</sup> Keeve H	Original Research Communications         Stained pursuit of nutrition, health, affordability and exploring the case of Indonesia         Handmaysh, <sup>1</sup> Ratil Jolat <sup>4</sup> Brent F. Kim, <sup>56</sup> Richard D. Semba, <sup>37</sup> Amy Deptford, <sup>1</sup> Jessica C Fanco, <sup>4</sup> Handman, <sup>365,00</sup> Shawn McKenzie, <sup>2</sup> and Martin W Bloem <sup>36</sup>	Contents lists wallable at ScienceDirect       Food Policy         ELSEVIER       Pool Policy         Journal homepage: www.elsevier.com/locate/foodpol       The development and application of a sustainable diets framework for policy analysis: A case study of Nepal         Shauna M. Downs**, Alex Payne <sup>9</sup> , Jessica Fanzo <sup>44</sup>
Public: Hwith Nurrition: page 1 of 14 The interface between consumers and th Myanmar: an exploratory mixed-metho Shauna M Downs <sup>1,2,*</sup> , Sara Glass <sup>2</sup> , Kay Khine Linn <sup>3</sup> <sup>10</sup> Department of Health Systems and Policy, Rugers School of Public H 089001 USA: <sup>21</sup> School of Advanced International Studies, Johns House Myanmar, USA: <sup>41</sup> School of Advanced International Studies, Johns House Myanmar, USA: <sup>41</sup> School of Advanced International Studies, Johns House Myanmar, USA: <sup>41</sup> School of Advanced International Studies, Johns House	doi:10.1017/S1369980018003427 their food environment in bds study <sup>1</sup> and Jessica Fanzo <sup>2,4</sup> Heilhi, 112 Patenco Street, New Brunswick, NI Joilmore, MD, USA: "HelpAge Inventional topkins University, Boltimore, MD, USA	Tradic Health Nummur: 25(4), 954-976 Examining the trade-offs of palm oil production and consumption from a sustainable diets perspective: lessons learned from Myanmar Shauna M Downs <sup>1,*</sup> , Khristopher Nicholas <sup>2</sup> , Kay Khine Linn <sup>3</sup> and Jessica Fanzo <sup>4</sup>	We want to be a state of the state
Control of the second sec	<text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text>	Contents lists available at \$60           Food Policy           ELSEVIER           When increasing vegetable production may worse           A simulation model in India           Marie L. Spiker <sup>10,1</sup> , Joel Welling <sup>1</sup> , Daniel Hertenstein <sup>1</sup> , Suvank           Kristen M. Hurley <sup>1</sup> , Roni A. Neff <sup>1,4</sup> , Jess Fanzo <sup>10,40</sup> , Bruce Y. L	en food availability gaps:

## Lessons from *local* food systems towards healthy and sustainable diets

- While global agendas matter, producing and accessing sustainable, healthy and sustainable diets is incredibly context-dependent.
- Global recommendations must be modified at the sub-national levels based on geographic challenges — adapted to cultural eating habits and traditions, local modes of production and value chains, diseases, and malnutrition burdens.
- Overall, in resource-constrained, climate-vulnerable places, there are increasing challenges for people in accessing healthy and sustainable diets: physically, economically, and socially.

### **Current Research Focus Areas**

01

Prioritizing and framing food systems in climate and international development global agendas 02

Improving *national* food system decision-making with better food systems science 03

Understanding how *local* foodscapes influence healthy and sustainable diets

## 04

Exploring climateimpacted geographic poverty traps on nutrition outcomes

## **Aim 4:** Exploring climate-impacted geographic poverty traps on nutrition outcomes

- Geographic poverty traps occur in areas that are geographically isolated or marginalized (remote, mountainous, overly dependent on a natural resource), and often lack infrastructure like roads, electricity, and clean water, making it hard for communities to escape.
- The aim of this research is to explore and analyze how climate further exacerbates geographic poverty traps and how, in turn, these traps further impact food security and nutrition outcomes, leading to deepened nutrition-based poverty traps and limited opportunity to adapt.



### Climate impacts riverine communities in Cambodia

Evaluating and supporting the health and environmental sustainability of food environments and diets in climate-vulnerable Lower Mekong River communities



Assessing key elements of multi-dimensional river food environments



Manohar, S., et al 2023 Bulletin of the World Health Organization, 101(2), p.140.

### Climate extremes faced by herders in Mongolia



Fig. 2. Signs of climate change perceived by herders or stakeholders associated livestock.

Dagys, K., et al 2023 Food Policy, 117, p.102468.

## Climate constrains east African pastoral communities



From our ethnography and photo voice studies, East African pastoral communities are among the most politically and economically marginalized in society and competition for dwindling land is a major instigator of conflict.





a. Scramble for Life A clear sky with scattered clouds shows lack of rain, and scramble of camels at the water trough show thirst and scarcity of water as a commodity... This photo shows hardship and struggle within this community living with animals. (Borana, TN, male, 36y)





e c. Innocence w wells on the same water in a dam. This area has a problem with clean drinking water... This community needs w ater otherwise there could be a i-arid with ack of rain my future. ) problem with disease. Clean drinking water is supposed to be provided to people, and there is a need to raise awareness of the dangers of drinking stagnant water. (Turkana, SLR, male, 22y)

## Lessons from *people* experiencing poverty traps in distinct *places*

- Climate- and nutrition-vulnerable communities should be involved in research in how they are experiencing climate change in the places where they live.
- For those populations already struggling with poverty, climate is making their situation worse, and out-migration is not always an option.
- Climate-adaptation strategies co-produced by communities are essential for those communities to escape poverty traps: we argue that investing in local food system supply chains and nutrition are potential strategies.

## We have more knowledge than ever before

#### Losing Earth: The Decade We Almost Stopped Climate Change

By Nathaniel Rich Photographs and Videos by George Steinmetz AUG. 1, 2018



"The risks of making well intentioned but inappropriate policy choices are much smaller than the risks of using a lack of evidence as an argument for inaction."

--UN HLPE report on food systems and nutrition (2017)

### We can't give up on research and evidence

- At a time when facts and evidence are under ever greater scrutiny, and even openly disregarded as suspect by some political and business leaders, the rigors of science and evidence must be maintained.
- Research has a vital role in charting a positive and sustainable direction for global food security, nutrition, and health.
- Research can and does bring about wholesale changes in attitudes, political thought, and action.



Perspective

A research vision for food systems in the 2020s: Defying the status quo

Jessica Fanzo<sup>a,\*</sup>, Namukolo Covic<sup>b</sup>, Achim Dobermann<sup>c</sup>, Spencer Henson<sup>d</sup>, Mario Herrero<sup>e</sup>, Prabhu Pingali<sup>f</sup>, Steve Staal<sup>g</sup>

<sup>a</sup> Berman Institute of Bioethics, Nitze School of Advanced International Studies (SAIS) and Bloomberg School of Public Health Johns Hopkins University 1717 Massachusetts Ave NW 730 Washington DC 20036 USA International Food Policy Research Institute, Poverty, Health and Nutrition Division, Addis Ababa, Ethiopia <sup>c</sup> International Fertilizer Association, Paris, France d University of Guelph Department of Food Agricultural and Resource Economics, Guelph, Ontario, Canada <sup>e</sup> Commonwealth Scientific and Industrial Research Organisation (CSIRO), Brisbane, Queensland, Australia f Cornell University Charles H Dyson School of Applied Economics and Management, Ithaca, New York, United States <sup>8</sup> Kuala Lumpur, Malaysia ARTICLE INFO

Keywords: Food systems Food security Malnutrition Research and development

Future studies





### Conclusion

- Food systems research is still evolving over the last 15 years but much more is now known about the necessity to take a food systems approach.
- While global evidence is critical, national and subnational local context research is key to understand adaptation solutions.
- Everyone has a role to play in improving food systems because every one of us participates in this system, sometimes multiple times a day.



### The core team who produces/d this work













Kate Schneider

Swetha Manohar

**Bianca** Carducci

Shauna Downs

Alison Rose

Jochebed Louis-Jean

Dannie Dinh



Alexa Bellows



Quinn Marshall



Elizabeth Graham





Rebecca McLaren





Jody Harris

Elizabeth Fox

Lais Miachon

### Incredible collaborations on key projects

#### The Food Systems Countdown Initiative Collaborators



#### **Pastoralist Sedenterization Project Field Team**



#### **Food Systems Dashboard Team**

#### **Core Food Systems Dashboard Team Members**

Lawrence Haddad The Global Alliance For Improved Nutrition Jess Fanzo The Columbia Climate School Rebecca Mclaren

Anna Herforth

The Global Alliance For Improved Nutrition

Maximo Torero Cullen The Food and Agriculture Organization of The United Nations

Catia Pedro The Global Alliance For Improved Nutrition

Ty Beal The Global Alliance For Improved Nutrition

Roseline Remans Glocolearning

Quinn Marshall International Food Policy Research Institute Harvard University And The Agriculture-Nutrition Community Of Practice
Stella Nordhagen

The Global Alliance For Improved Nutrition
Natalia Estrada Carmona

The Alliance Of Bioversity International And The International Center For Tropical Agriculture

Kristina Sokourenko The Global Diet Quality Project and Food Prices for Nutrition

Esther Mundia The Global Alliance For Improved Nutrition

#### **Past Food Systems Dashboard Team Members**

Andy Jones University Of Michigan Alexa Bellows

Lais Miachon Johns Hopkins University Ahmed Raza The Food And Agriculture Organization Of The United Nations

#### **People Centered Food Systems Consortium**





Confederazione Svizzera Confederaziun svizra



Food and Agriculture Organization of the United Nations

mproved Nutritio



World Food Programme

## Funding sources

#### Thank you!

j.fanzo@columbia.edu



JESSICA FANZO

#### Can Fixing Dinner Fix the Planet?

