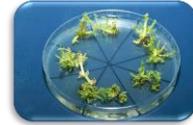


## ***Opportunities and Challenges for Research on Food and Nutrition Security and Agriculture***

**Overview: IAP Global Synthesis Report**

Joachim von Braun,  
Center for Development Research (ZEF)  
Bonn University

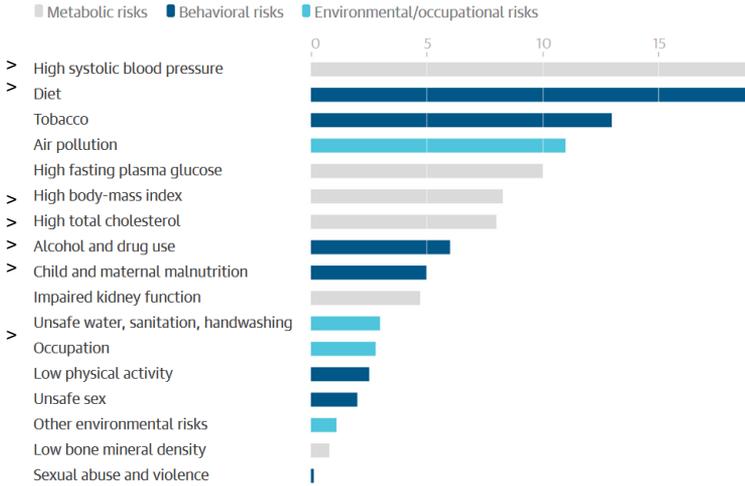


## **Eight big global food system deficiencies**



1. **Stunting:** has been reduced and child survival increased, although both remain unacceptably high.
2. **Hungry, undernourished people:** rose to over 821 mill. in 2017 from 777 mill. in 2015.
3. **Micronutrient deficiencies:** harm over two billion.
4. **Obesity:** tripled to more than 800 million people between 1975 and 2016.
5. **Unsafe food:** affects millions of people (ca. 1 in 10 people), e.g. aflatoxin
6. **Low production and high losses and waste:** About one-third lost or wasted.
7. **Pressures on the environment:** damage to land, water, seas, atmosphere.
8. **Poverty in the small farms:** the about 400 Mill. small farms are home to largest share of poor people in the world

## Nutrition and Food Figure Prominently in Global Burden of Diseases



Poor diet is a factor in one of five deaths

Source: Institute for Health Metrics and Evaluation 2017 (Global Burden of Disease study)

Lyons Braun Oct 14, 2018

## The Global Report Team

Editor:	Expert editorial group	
<p>Robin Fears with the support of Claudia Canales</p> <p><b>Expert editorial group co-chairs:</b> Volker ter Meulen (Germany) Joachim von Braun (Germany)</p>	<p>Tim Benton (UK) Eduardo Bianchi (Argentina) Michael Clegg (USA) Adriana de la Cruz Molina (Mexico). Christiane Diehl (Germany) Mohamed Hassan (Sudan) Sheryl Hendriks (South Africa) Elizabeth Hodson de Jaramillo (Colombia) Molly Hurley-Depret (Luxembourg)</p>	<p>Lyunhae Kim (Republic of Korea) Yoo Hang Kim (Republic of Korea) Krishan Lal (India) Jeremy McNeill (Canada) Paul Moughan (New Zealand) Jackie Olang-Kado (Kenya) Jutta Schnitzer-Ungefug (Germany) Aifric O'Sullivan (Ireland) Katherine Vammen (Nicaragua)</p>

Lyons Braun Oct 14, 2018

## The IAP process in preparing this report

- **Science base:**
  - Issues spanning health, nutrition, agriculture, climate change, ecology and human behaviour
  - to find sustainable solutions for national and global food systems.
- **Collective academy work**, aiming for:
  - A strong consensus around controversial issues,
  - Recognition and appreciation of diversity,
  - Evidence-based messages about the global opportunities and challenges,
  - Learning between regions sharing evidence, experience, good practice.

Lyon, France Oct 14, 2018

- > 4 reports / 4 hemispheres (Europe, Americas, Asia, Africa)
- > **Now toward a global report (here a preview)**

### The outcomes:

1. A set of **priorities** for generating and using the knowledge base to support scientific research, technological and organizational innovations
2. to inform and shape food, nutrition, agriculture **policy** choices

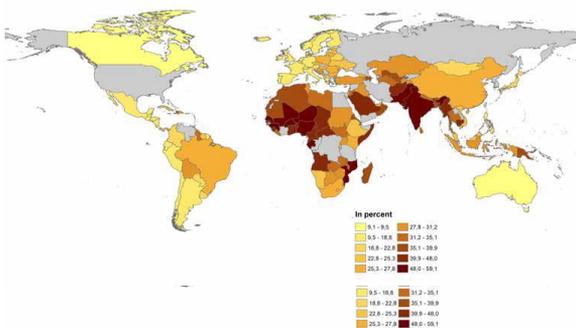


## Noting regional differences and global commonalities

- Regions differ:
  - Agricultural productivity, access to knowledge and services
  - Food and nutrition security context
  - Scientific infrastructure and research capabilities
  - the degree to which policy making is at the regional level
- But some elements are common or have similarities:
  - Fragmentation of the research system, policy and support
  - Consumption and nutrition behaviour
  - co-dependent on global trade, prices and investment

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## Prevalence of Anemia among Women (%)



## Global Hunger Index 2018



Source: The World Bank (2017): anemic data for 2016, United Nations (2017): population data for 2015.

<http://www.globalhungerindex.org/results/> Welthungerhilfe and Concern International

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## Three Frameworks guiding IAP global considerations

1. Policy perspectives
2. Food system
3. SDGs

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### *Need for guidance to global FNA debates*

**Framework** - organize, form boundaries around inquiry, set up general relationships...

**Concept** - a general representation that is common to several specific objects... (Kant,1819)

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## Re 1: Two principal policy perspectives

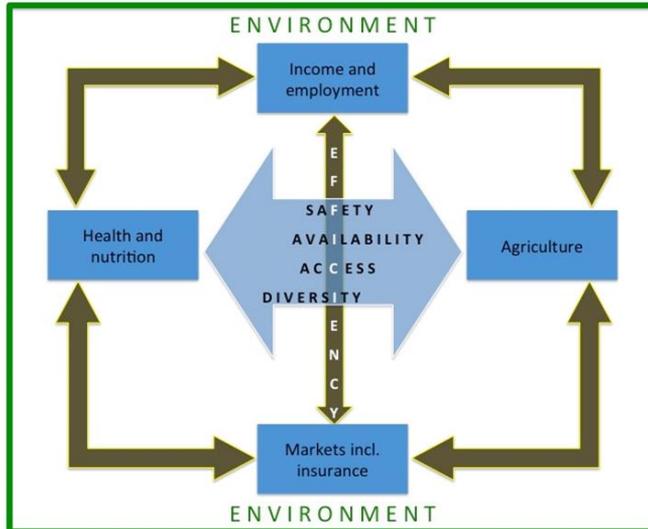
1. **International public goods** – those that have to be provided on a scale that is beyond even large countries (e.g. food safety; rule based trade; shared science information etc.)
2. **Risks and opportunities** - their transmission in an uncertain world that is inter-connected (e.g. pollution; new biosciences; digitisation etc.)



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## Re 2: Conceptual framework - the food systems (national and global)



- **Dynamics:** Agriculture and food systems are in transition
  - **Pressures:** growing population, urbanization, climate change and other environmental change, economic inequality and market instability
  - **Peoples' Behavior:** food demand increasingly similar; energy-dense; and micronutrient deficient
- > **Planetary Food System Health**

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## Re 3: The SDGs as a framework, with a focus on innovations

- Provide a framework for meeting the challenges: fresh engagement by science across key goals related to food, nutrition, health, agriculture, environment
- Desired outcome: access for all to a healthy and affordable diet
- With a key role of innovation (science, and policy innovations)



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## IAP's broad issues suggested for enhanced global science and policy actions in FNA

1. Developing sustainable food and nutrition systems, to deliver health and well-being, linked to *transformation in the circular and bioeconomy*.
2. Insights and measures for *transformation to a healthy diet for all*.
3. Food *production and utilization* issues, covering efficacy, sustainability, climate risk and diversity of resources.
4. Capitalizing on *opportunities in the biosciences* and other advancing sciences, global sharing of evidence.
5. Addressing the *food-energy-water-health nexus for sustainability*.
6. Promoting activity at the *science-policy interfaces*, with new international science advisory mechanisms.

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## Transformation toward a healthy diet! What and how?



- **How** is a “Healthy Diet” constituted? ...measured? ...delivered?
- **Defining “healthy diet”**: A safe and healthy diet contains the appropriate amounts of nutrients needed to meet and not exceed all requirements in line with age and life stage, and not contain non-nutritive substances that can cause health risks in quantities beyond minimum acceptable limits (Declaration of Pontifical Academy of Sciences and Global Alliance for Improved Nutrition(GAIN) conference on “Food Safety and Healthy Diets” Sept. 2018)

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## IAP report **examples**: where global research can help to answer key questions of food, nutrition, agriculture (FNA)

- What are the trade-offs between nutritional and environmental goals?
- How to incentivize altered diets?
- What opportunities and risks of bioscience innovations (e.g. CRISPR CaS)?
- What are the methodological issues for improving use of big data in FNA (collection, access, etc. )?
- How to better include low and middle income countries science communities in the global FNA science system?

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## IAP report **examples**: on production and nutrition, scientific frontiers

- Orphan crops, new food sources and functional foods (Capturing indigenous knowledge, defining new health properties, food science and technology)
- Social sciences research to understand, inform and influence consumer behaviour
- Personalised nutrition, coupled with smart monitoring of individual status
- Diet-gut microbiome-disease linkages

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## IAP suggestion: infrastructure and capacity ...with engagement by Academies internationally

- Vital to upgrade scientific infrastructure and to:
  - Increase collaboration between countries
  - Share scientific expertise and facilities
  - Help build capacity in emerging economies.
- New trans-regional research efforts:
  - trans-regional engagement on SDGs,
  - climate objectives, and
  - science opportunities of global relevance



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## Institutional innovations needed, not just technical ones

- Institutional, economic, and *political innovations* should accompany and often may need to precede nutrition and public health interventions for effective and sustainable nutritional improvement.
- *Incentives* for behavioural change and for empowerment, emerge from institutional and economic innovations.
- More nutrition policy and program implementation research at scale, about appropriate health oriented *regulation* of markets and industries.

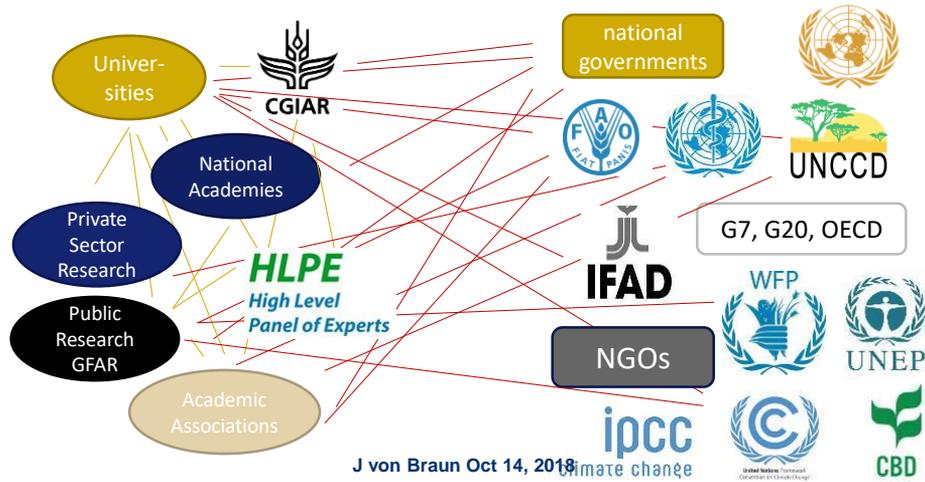
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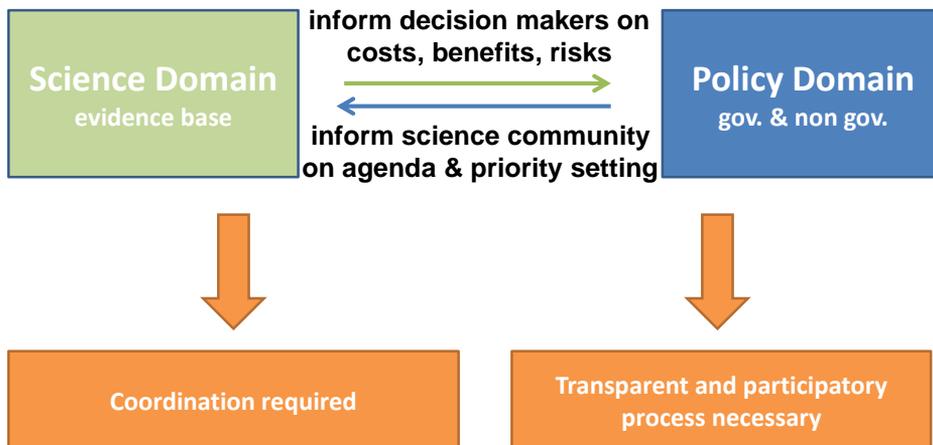
# The science / policy interface of food, nutrition, agriculture needs re-design

8 clusters of supply

15 clusters of demand



## Toward an “International Panel on Food, Nutrition & Agriculture” (somewhat like IPCC)



Source: von Braun, Kalkuhl, ZEF, 2015.

## In sum: mobilizing global science for overcoming the big global food, nutrition and agricultural problems

1. Stunting
2. Hunger and undernourishment
3. Micronutrient deficiencies
4. Obesity
5. Unsafe food
6. Low production and high food losses and waste
7. Pressures on the environment
8. Poverty in the small farms

