

# Food, Diet and Nutrition in a Changing Climate:

## Report from a Virtual Roundtable

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## Contents

Motivation.....	1
Discussion Questions .....	2
In Summary .....	5
Participants .....	5
Resources.....	6
Acknowledgments.....	6



*Vietnam Food Market*

## Motivation

With support from the Wellcome Trust, AgMIP has brought together interdisciplinary scientists, tools, and stakeholders to create a plan to establish science-based pathways to a world food system that enhances health, achieves food security and improved nutrition, and promotes sustainable agriculture under rapidly changing extreme climate events.

The plan is being built on a new vision for intervention analysis: It constructs a more robust, scientifically advanced framework that will enable vulnerability assessment and testing of food system policies, management strategies, and investments in low, middle, and higher-income countries. It enables the biophysical, economic, and nutritional outcomes of food system shocks to be evaluated under scenarios of ongoing changes in climate, technology, socioeconomic development, and diet.

The linkage from global to regional factors will be tested for its likelihood to improve nutrition and health in Sub-Saharan Africa. Promising interventions will be explored and improved in partnership with local stakeholders and scientists with the intent to enable a science-based method for prioritizing pathways of policy change for food/health systems – such as policies that support more diversified agriculture and nutrient-rich diets. Consideration of regional to global factors necessitates the building of a new, international community in which multi-sectoral stakeholders and scientists work together to envisage and enable a new standard of scientific rigor for the work – such as a strategy for resilience to multiple-breadbasket failures.

The Virtual Roundtable was the first of what is planned to be a series of opportunities for multinational public and private sector food and agricultural system stakeholders to share their motivations, priorities and perspectives. The intent is to foster diverse and novel partnerships to advance the development and integration of decision-frameworks into scientific solutions and scientific concepts into decision frameworks. We see this as essential if we are to achieve resilient, stable and sustainable food systems that deliver nutrition and improved health at national, regional, and global scales.

The Virtual Roundtable was centered around three discussion questions:

1. How can nutrition and health be integrated into sustainable food systems?
2. How do weather shocks affect your organization now, and how might climate change affect it in the future?
3. What are the barriers to achieving a food system that delivers both health and productivity?

This report summarizes key points from the discussion of these questions by experts from BASF Bioscience Research, Columbia University, the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), IBM, the International Life Science Institute (ILSI) Research Foundation, Johns Hopkins University, Mars Incorporated, NASA Goddard Institute for Space Studies, Nestlé, the Syngenta Foundation, US Dairy Management Inc., Willis Towers Watson, and the World Health Organization.

## Question 1: How can nutrition and health be integrated into sustainable food systems?

The nature of our global nutrition challenge is composite, with overweight, underweight and malnourishment all being significant issues, often in the same place. The abundance of high-fat and sugar content foods (e.g., sugary drinks are widely consumed and contribute to the burden of non-communicable diseases) and insufficient high-quality foods consumed broadly are key drivers of these issues, as is the inequitable distribution of food around the world.

Studies indicate that farmers will need to grow 70% more food by 2050 to meet world food demand. More work is needed on food sustainability to ensure that every calorie counts from the perspective of achieving the greatest amount of nutrition for the least environmental impact possible.

Some attention is now being paid to the source of nutrients, and the environmental impact of production practices (e.g., in palm oil production). Animal-sourced food consumption is being discouraged in some geographies, while at the same time they remain critical for nutrition in others (e.g., Sub-Saharan Africa). On the other hand, fruits and vegetables are nutritionally rich, but they can have a high negative impact on land-use and water.

There is a lot of ongoing work measuring the sustainability impacts of raw materials, and a lot of harmonization can be achieved in this area. It is important to include micronutrients and secondary nutrition benefits in addition to raw materials when looking at impacts on health, wellness, and sustainability.

Food loss, waste, and inefficiency are additional problems that need be addressed. In developed countries, waste is more prominent at the retail and consumer levels, while in developing countries loss predominates at the farm and processing levels. Sustainability should be looked at across all stages of the food system: food production, storage, transport, processing, and consumption, and there is a need for cohesive policies that comprehensively and cohesively consider these..

Information asymmetries make tackling constraints to an equitable, sustainable food system very challenging. Making information more transparent is critical, and open data would assist in closing knowledge gaps. There are roles for the private sector in this space - driving investment so that innovation becomes affordable.

Environmental concerns are low on the list of priorities for most peoples' consumption choices. The "food environment" and food choices are influenced primarily by such issues as price, taste, and convenience – less so nutrition, and virtually never sustainability. Ways to address this include establishing social movements to promote healthy behaviors and personalizing nutrition, for example through "apps" that provide nutrient calculations and recommendations. Changing the perspective of consumers could allow food choices to be assessed more like consumer selection of medicines, so that people fully consider the impact of their consumption options and choices.

In developing regions like Africa, it is critical to consider women's empowerment as a part of the process of improving food systems, as well as health and nutrition in the first 1000 days of life, which critically includes a woman's nutrition during pregnancy.

AgMIP modeling efforts can help close knowledge gaps. Model outputs are starting to include nutritional value in addition to yields, going beyond "farm to fork" and into "farm to flesh". Graphics to display this kind of work with inputs from nutritionists would be an extremely valuable, if ambitious, goal.

The insurance industry can also play an important role, but it is still focused on crop yields rather than nutrition per se. How can the insurance industry put a useful metric on risk-based pricing of foods? Micro-insurance focuses on the individual farmer and his or her ability to harvest what they grow. This is completely different from the macro world of insurance and re-insurance.

*"Thinking about sustainable food systems, we need to grow about 70% more food by 2050. How can we make every calorie from the crops count for nutritional value and have the lowest environmental impact? There is promising work from the models that have been developed in making these predictions and they can optimize and include food policy. We think of "farm to fork" but we need to think "farm to flesh", we need to go from nutritional value into health."*



## Question 2: How do weather shocks affect your organization now, and how might climate change affect it in the future?

Insurance and re-insurance innovations are needed to minimize the impacts of food system shocks. This has become an area of increasing focus for the industry, which is moving from a hazard perspective to insured loss. There is also a need to expand analytical techniques and insurance products to reduce the existing production gap. The insurance sector is looking towards catastrophe bonds and making protection more affordable.

To improve resilience, insurance for extreme weather events is available, but there are some limitations, as far as the period of time covered. Farmers may be covered in the short-term, but an insurance company can decide to drop an organization in the long term. The World Bank and the United Nations have looked into these issues and addressed some of the limitations, but work is still needed to make the outcomes better.

Many parts of the food sector are already being directly impacted by climate change and drought. Climate shocks lead to acute crises, and emergency response programs are being reworked. In the US, 50 acres (20 hectares) of farmland are being lost per hour, due mainly to long-term drought (e.g., in California) and the expansion of suburbs. Climate change and extreme weather events cause volatility in commodity prices, which means that some years there is hesitation to invest in innovative products, both in research and on-farm production.

Food system shocks pose a significant problem and are projected to increase, and they should be taken into consideration for modeling purposes. Models should also consider the impact of climate change on future pest and disease occurrence, so that better responses (i.e., new products) can be developed to help mitigate the effects on crops and livestock around the world.

Additionally, there is a need to improve data management systems for farmers to help them make better decisions on potential adaptation options, including water allocation, crop rotation, fertilizer use, etc.

*“Our foundation’s mandate is supporting smallholder growers in developing countries and making them more resilient to weather stress. Potential resilience actions include traditional breeding for drought tolerant crops, agronomic practices, and modeling of insurance programs based on weather indices so that insurance products are cheap and affordable. Weather events have become less stable. That’s where our interest comes into modeling. Having long term scenarios so we can adapt our products and our interventions.”*

*“Because of climate change and more extreme weather events, there is a lot of volatility. We do see in some years a lot of hesitation on innovative products. The modeling work can help us anticipate effects of climate change in the local agro-environment that will develop all over the world in the coming years, including what pests and diseases we can expect. Also farmers in developed countries are faced with difficult decisions when it comes to climate, including decisions on crop rotations and irrigation. The agriculture industry is looking to advise farmers, there is an opportunity for modelers to give the right information so farmers can make the right decisions.”*

### Question 3: What are the barriers to achieving a food system that delivers both health and productivity?

Current governmental subsidies generally favor large commodity crops and therefore do not incentivize production of foods that are either nutritious or more favorable from an environmental perspective. There is currently an unhelpful food system focus on quantity (i.e., grains) instead of quality and diversity (i.e., genetic and crop diversity). Investments are needed to help promote more nutritious and sustainable diets, as is research on nutrition and health in the context of complete diets and not on its individual parts (i.e., ingredients).

The food industry has to be proactive about climate change impacts on production. For example, damage from catastrophic events can impact multiple seasons. This needs to be considered when developing insurance instruments.

Working as a farmer is no longer considered a viable livelihood in many regions of the world. In order to have a food system that delivers nutritious foods there should be more incentives for farmers to grow fruits, vegetables, and other smaller crops but farmers are rewarded for yield not the nutritional value of what they grow. This is compounded by the erosion of the asset base of smallholder farmers. Most interventions have focused on the insurance of the crops or livestock rather than the farmers themselves.

*"The agriculture system globally is focused on a few commodities. If you want to have a food system that delivers nutrients there should be more incentive for farmers to grow more vegetables and smaller crops. But farmers are more rewarded on the output of calories and not on nutrition. That's a huge challenge. How do we bring economics into it to reward farmers? Investment for special handling, etc., especially in the developing world."*

*There are issues around policy coherence. They are not necessarily aimed at improving nutrition and sustainability. We need planning that is more centralized, the investments need to be aligned to those objectives. The metrics are an important issue. We need to have a reshaping of the food system: what foods are consumed and making those food appealing and available to consumers and ensuring that demand is met. Agricultural systems should be aligned to that. So we can consume more food and nutrients but more of the necessary and less of the unnecessary."*



Farmers in Southern India

## In Summary

Several overarching themes emerged from the round-table discussion. Understanding, assessing and characterizing uncertainties and systemic risks is of utmost importance to the business and insurance sectors of the food system. It is imperative to develop viable, resilient farming communities that can sustain food and nutrient production in spite of increasing extreme weather events and shocks.

Linkages from farm to nutrition must go beyond staple crops, and incentives are needed from the farm all the way to the end consumer. Metrics are hugely important so that we can track the process and the needed policy coherence. Actions and incentives to anticipate and enable innovation are also important.

The need for policies across the entire food/nutrition system to develop coherence is essential. The themes raised provide an important basis from which to create a resilient food system that can generate positive gains in nutrition and health.

Participants expressed strong support for the type of community building, model improvement, and practical application of integrated models for the food and health system such as was presented in the

*“When it comes to extreme events, we try to help our clients with redundancy. Part of it is to try to measure systemic risks and to run analysis of decision making under uncertainty. We have learned that extreme events can require rapid innovation in information technologies. The impacted people need a different infrastructure to be able to communicate and find help. In a food system, how might such alternate systems – the ones we don’t yet have - work?”*

AgMIP team’s proposal to the Wellcome Trust. There is a strong appetite for continued engagement across this stakeholder community, with several participants commenting about the value of the session, especially the opportunity provided by the round table for organized discourse and sharing of ideas among a diverse group of stakeholders and scientists.

## Participants

### **Francesco Branca**

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### **Jessica Fanzo**

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### **Dominik Klauser**

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FANRPAN

### **Simba Sibanda**

Managing Director  
FANRPAN



## Resources

AgMIP website: [www.agmip.org](http://www.agmip.org)

Adiku, et al. Climate Change Impacts on West African Agriculture: An Integrated Regional Assessment (CIWARA). [Full Text](#).

FANRPAN. Responses to Virtual Roundtable discussion questions. [Full Text](#).

Gustafson, et al. Seven Food System Metrics of Sustainable Nutrition Security. [Full Text](#).

ICMIF. Formation of the Insurance Development Forum by the United Nations, the World Bank Group and the insurance industry. [Full Text](#).

Lloyd's Emerging Risk Report. Food System Shock: The insurance impacts of acute disruption to global food supply. [Full Text](#).

MCII & BMZ. Climate risk insurance for the poor. [Full Text](#).

Nelson, et al. Agriculture and climate change in global scenarios: Why don't the models agree. [Full Text](#).

Rosenzweig, et al. Assessing agricultural risks of climate change in the 21st century in a global gridded crop model intercomparison. [Full Text](#).

UK/US Task Force. Extreme weather and resilience of the global food system. [Full Text](#).

WillisTowersWatson. The Role of Insurance and Reinsurance in Disaster Risk Management and Risk Mitigation. [Full Text](#).

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Tanzanian farmers

*"Thanks for the update on your activities and the lively discussion that the recent virtual roundtable provided. The nutrition dimension is a step removed from most mainstream insurance activities at the moment, but perhaps not for long!"*

*"I just want to say my sincere appreciation for pulling this group together. We need visionary leaders and groups who force more interdisciplinary conversations. I was so impressed and learned so much. I was thrilled to see the insurance sector was present as that will drive a significant amount of change to the fortune 500 and food and agricultural sector if they get involved in a meaningful way. I also saw your academic list and I recognized some people who I admire greatly. We hope your efforts will continue. We are more than happy to volunteer and help your efforts in any small way we can."*