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POLICY BRIEF

Unlocking investment for nutrition-sensitive food systems research: turning N4G commitments into UNFSS+4 actions

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Key messages

- **The burdens of malnutrition continue to grow.** Two billion people lack key micronutrients; by 2030, one child in five could be stunted and three billion adults overweight or obese.
- **Food systems are not nutrition-sensitive.** Unequal food environments and certain trade regimes keep healthy diets out of reach for many households, while food industry stimulates demand for cheap, unhealthy ultra-processed foods high in fat, sugar and salt and soft drinks.
- **Structural barriers hinder progress.** Short-term political-economic incentives and power imbalances; sectoral silos (agriculture, aquaculture, nutrition, health, energy, environment, education or trade); fragmented global natural-resource governance; and a science-policy gap fuelled by misinformation.
- **Eleven research priorities can fill knowledge gaps.** (1) sustainable and nutrition-sensitive agriculture, (2) local food systems and short supply chains, (3) climate change and environmental degradation (including land, water, ocean) impacts on food quality, diversity and safety, (4) trade-offs related to food processing (nutrient preservation vs. health risks vs. prices), (5) consequences of international trade on healthiness and sustainability of diets, (6) food environments impact on diets, (7) political and socio-economic drivers of diet, (8) equity in access to sustainable healthy diets, (9) multi-level governance and coordination, (10) true cost accounting and (11) nutrition-sensitive innovations.
- **Seven priority actions can unlock progress.** (1) cross-sector coordination, (2) local capacity building, (3) multi-stakeholder partnerships, (4) inclusive policy design, (5) nutrition-focused social-protection schemes & inclusion of health in all policies, and (6) targeted funding for research on climate-resilient and nutrition-sensitive food systems, (7) full integration of nutrition as an essential driver to the food systems transformation dynamics.
- **N4G pledges and the UNFSS+4 provide the financing window to turn these recommendations into support for research and innovation toward sustained, equitable action for healthier, more resilient and sustainable food systems.**

1. Background: The disappointing persistence of the burdens of malnutrition

Sound evidence shows that **adequate nutrition is crucial across the life course** to support health, development, and well-being. During the **first 1,000 days**, and even prior to conception, **maternal nutritional status** directly shapes new-born health and development, with long-lasting effects into adulthood. **Appropriate dietary intake in infants and young children** is central for health, physical and cognitive development: combining **breastfeeding**, the **timely introduction of complementary foods**, rich in iron, lipids and micronutrients, and a diversified diet prevent growth retardation and micronutrient deficiencies, allergies and adverse feeding habits [1, 2]. Establishing a healthy **gut microbiome** also protects against acute malnutrition in early childhood. Caregiver guidance through **childhood and adolescence** remains essential to ensure diets rich in fruit, vegetables, whole-grain cereals, legumes, and nutrient-dense animal-source foods such as eggs, dairy, and aquatic foods while limiting intake of unhealthy and so called ultra-processed foods high in fat, sugar, and salt. Additionally, **ageing populations** face nutrition-related challenges that can lead to undernutrition, cardiometabolic disorders, osteoporosis, sarcopenia, and cognitive decline. Governance towards **adequate food environments**, including food supply, is key to guiding consumers towards healthy and sustainable choices throughout the life course.

Despite progress, the **multiple burdens of malnutrition** persist around the world. Micronutrient deficiencies affect at least two billion people [3] and, by 2030, 20% of children under five could still be stunted, while nearly three billion adults may be living with overweight or obesity [4]. The burden of diet-related non-communicable diseases, including those that may not be accompanied by overweight or obesity, is also very large. At the global scale, human capital productivity losses linked to under-nutrition and micronutrient deficiencies amount to about US \$21 trillion, while the social and economic costs of obesity and overweight reach US \$20 trillion over ten years [5]. Addressing this major public-health issue demands a transformation of food systems that puts diets and nutrition at their core.

2. Key issues related to nutrition and food systems

2.1 Nutrition at the core of food systems

Food systems exist first and foremost to deliver adequate nutrition through healthy diets. Yet, food environments that structure access to foods are marked by deep inequalities both between and within countries [6]. Unfortunately, beyond the failure to deliver healthy diets, food systems are also major drivers of climate change, biodiversity loss, soil, water, and air degradation, as well as widening socio-economical inequalities. They also overconsume planetary resources [7].

In 2021, the United Nations Food-System Summit (UNFSS) launched a global call to transform food systems to meet the 2030 Agenda. Transformation must therefore enable resilient food systems

and deliver diets that are not only healthier diets but also more sustainable and inclusive. In this context, integrated, science-based solutions are more essential than ever. Actions to support sustainable healthy diets must cover the entire global food system: supporting agricultural production systems that provide diverse, healthy and safe foods for populations at the local and global levels, reducing the environmental impacts of terrestrial and aquatic food supply chains, increasing their resilience, and guiding healthy food choices by increasing accessibility and improving affordability of healthy diets [8] – particularly for vulnerable groups. In parallel more environmentally sustainable, local, diversified systems capable of supplying culturally-adapted, balanced diets rich in nutrients – including fruit, vegetables, legumes, whole grains, and aquatic foods – can also significantly reduce acute and chronic malnutrition and diet-related non-communicable diseases [9].

Public health nutrition policies can also have synergistic positive impacts on food systems. For instance, promoting and supporting breastfeeding benefits both mother and child, while being more sustainable in terms of health, affordability of diets, social or environmental impact. Policies related to food environments (e.g. targeting consumers), such as front-of-pack labelling, reducing unhealthy and so-called ultra-processed food consumption through fiscal measures; or encouraging a balanced red and processed meat consumption can offer dual benefits: health-related, in terms of colorectal cancer prevention, and environmental, due to lower greenhouse gas emissions [10].

2.2 Structural barriers to nutrition-sensitive food systems

Despite growing knowledge of the links between nutrition and food system dynamics, solutions for better-nutrition-for-all scale up slowly, and public policies often fail to tackle nutrition and food insecurity challenges effectively.

Several interconnected reasons contribute to these challenges:

- **Specialised agricultural production areas** are highly efficient and contribute to food security, but come at the cost of homogenization and reduction in food variety and nutrient quality, intensification and increased vulnerability to biotic and abiotic shocks (pests, climate disasters, conflicts), with associated risks of price volatility and supply-chain disruptions. Specialisation undermines varieties, species and product diversification, and thus resilience.
- **International trade** prioritises export-oriented cash crops and aquatic food commodities to the detriment of nutritious foods for domestic markets [11]. This exposes low-income urban households to high acquisition costs for nutritious foods, while rural communities replace their subsistence food production with cash crops and see their purchasing power eroded by deteriorated production conditions and vulnerability to shocks.
- **Short-term incentives and power imbalances.** From agricultural and aquatic food political agendas to food environments, decisions are often locked in short-term economic and political decision timelines that prioritise cheap, nutrient-poor foods over long-

term sustainability, diversity, and quality, and also reflect the interests of the dominant actors in the current agri-food systems.

- **Institutional and sectoral silos.** Agriculture and aquaculture, nutrition and health, energy, environment, education and trade still operate in parallel, with their own resources, agendas, and sometimes conflicting objectives. Genuine integration requires breaking institutional and disciplinary barriers and adopting holistic approaches that reflect real-world complexity. Efficient approaches to creating enabling environments for cross-sectoral collaboration within existing systems still remain a challenge to address.
- **Fragmented natural resource governance.** The lack of supra-national coordination for key resources (water, soil, ocean) hampers sustainable decision-making. Geopolitical fragmentation widens sustainability gaps and delays decisions. Corporations' influence can reinforce inaction on climate change and biodiversity loss.
- **Science–policy gap and misinformation.** Despite growing scientific evidence on sustainable healthy diets and nutrition, research translation into accessible, actionable knowledge for decision-makers remains a challenge. Evidence and data remain under-utilised at global, regional, national, or local levels even though examples exist of effective approaches, especially within the nutrition sector [e.g., 12]. Misinformation, amplified by social media, further undermines trust in science.
- **Lack of cooperation and consistency between scales of governance.** The lack of link between local transitions, national programs, and global systems prevents coherent and efficient responses at multiple levels to the complex challenges facing the current food system.

3. Research priorities and institutional contribution.

Within this context, **research conducted across the entire food system**, linking food supply chains through sustainable healthy diets to nutrition, health, socioeconomic and environmental outcomes, is of utmost importance to address demographic and environmental challenges and accelerate the achievement of SDG2 [13]. Some major research priorities, for various sectors, include:

Production-focused sector

- **Sustainable and nutrition-sensitive agriculture.** Co-designing and assessing the impact of agricultural practices and systems on diets (being nutritious, diversified and safe foods that are affordable and accessible for people), while reducing their impact on the environment and biodiversity, ensuring decent incomes and a better distribution of value. Agroecology must be assessed as a more sustainable and inclusive alternative to conventional systems.
- **Local and agroecological food systems and short supply chains.** Understanding how they contribute to healthy food

supply, healthier dietary choices, local development, affordability, and lower carbon footprint. This is all the more relevant in constrained territories (limited arable land, soil pollution, water scarcity...).

- **Climate and environmental degradation impacts on food quality, diversity and safety.** Quantifying how drought, floods, and temperature shifts, as well as poor soil quality, water availability and quality, alter key nutrient profiles (micronutrients, omega-3 fatty acids...), their availability, and the implications for territorial nutrition security and food diversity. Evaluating impact on food contaminants, and (re-)emerging safety hazards (mycotoxins, pesticides...).

Value chains/markets focused sector

- **Food processing trade-offs.** Balancing benefits of food processing (safety, nutrient preservation, and environmental sustainability) with health risks (including metabolically mediated pathologies, intestinal integrity and allergenicity), while ensuring affordability.
- **International trade and consequences on healthiness and sustainability of food supply.** Qualify the contribution of international trade on food availability and healthiness and sustainability of diets.

Consumers, drivers of food choice incl. food environments focused sector

- **Role of food environments vs. individual responsibility** in sustainable healthy diets. Establish the role of supply quality, accessibility, prices and marketing on food choice decisions, vs. individual habits.
- **Socio-economic drivers of diet.** Analysing how cultural, social, and income transitions influence food choices and eating behaviour. Using behavioural sciences to develop and evaluate interventions. Considering social media, both as a threat (via misinformation) and as an opportunity to promote healthier behaviour.
- **Equity in access to sustainable healthy diets.** Studying how price volatility, subsidies, and taxes affect access across income groups. Assess how indigenous and local knowledge systems can help bridge the nutrition and sustainability gap and be integrated in food based dietary guidelines.

Politics, governance and financing focused sector

- **Governance and coordination.** Designing mechanisms that link various sectors such as territorial-use planning, food production, health, environment and trade to nutrition outcomes at different scales. Experimenting innovative territorial governance in living labs can provide useful feedback towards scaling up.
- **True cost accounting.** Beyond pioneering work [9], improve valuation of externalities related to environmental (e.g., biodiversity loss), health (e.g., diet-related exposure to contaminants) and social impacts (e.g., labor rights).

Innovation sector

- **Nutrition-sensitive innovations.** Innovations can enhance diets' quality and food systems' sustainability. On the supply side, co-developing agroecological practices, low-trophic and multi-trophic aquaculture and (bio)fortification can ensure production of diversified, nutritious, safe, and affordable foods. On the demand side, applying nutrition-sensitive school meal schemes, the use of social media to curb behaviors and inclusive innovations and business models could accelerate the evolution of social norms to ensure healthy and sustainable diets. Research institutes operating at global level are actively involved in promoting intervention-based approaches, working directly with their local or national partners to co-design and implement innovations, and assess their impact through randomized controlled trials.

4. Recommendations for policy makers and investors

1. **Strengthen cross-sector coordination mechanisms** that link food production, environment, diets, nutrition, health, trade, and diverse knowledge systems.
2. **Invest in local capacity building** – from small-scale actors to local decision-makers – to mainstream diversified, sustainable healthy diets and practices.
3. **Strengthen multi-stakeholder partnerships and governance** to translate science into action. Ensure food environments are not only shaped by private interest.
4. **Design food policies and interventions through inclusive processes** that actively involve and address the needs of populations, especially that of marginalised groups.
5. **Scale up social protection programmes and institutional food provisions** that procure locally-produced safe and diversified foods, or (bio)fortified foods - such as school meals, in addition to their nutrition education activities. **Include nutrition and health in all policies per One Health principle.**
6. **Allocate targeted finance** for priority research on climate-resilient, nutrition-sensitive food systems, including long-term territorial observatories.
7. **Fully integrate nutrition as an essential driver to the food systems transformation dynamics.** Nutrition and sustainable healthy diets are not only outputs of food systems, they should drive transformation.

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5. From Paris to Addis Ababa: high time to turn words into action

Nutrition took centre stage at the Nutrition for Growth (N4G) Summit in Paris (March 2025), where pledges totalled more than US\$28 billion. The forthcoming UNFSS+4 Stocktake in Addis Ababa will review progress on food system transformation towards the 2030 Agenda. Together, these summits offer more than aspirational declarations: they create concrete entry points to reshape and scale financing for research and innovation on nutrition-sensitive food systems. By adopting the accountability frameworks, inclusive governance models, and funding dialogues used in Paris, stakeholders can secure the sustained, equitable, and coordinated investment needed to implement the recommendations outlined above. Such commitment is not only a scientific imperative, it is a cornerstone of global food and health security.



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