



SUSTAINABLE FOOD SYSTEMS & AGRICULTURE

POLICY PAPER

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TABLE OF CONTENTS

FOREWORD BY THE TASK FORCE CHAIR	6
FOREWORDS BY THE TASK FORCE CO-CHAIRS	8
RECOMMENDATIONS: EXECUTIVE SUMMARY	12
INTRODUCTION	16
RECOMMENDATION 1	22
RECOMMENDATION 2	40
RECOMMENDATION 3	58
ANNEX A – GLOSSARY	81
ANNEX B – COMPOSITION AND MEETING SCHEDULE	82
ANNEX C – PARTNERS	90





FOREWORD BY THE TASK FORCE CHAIR

Food systems are complicated combinations of interrelated and interdependent social, economic, environmental, and political systems. They encompass “the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption, and disposal of food products that originate from agriculture, forestry, or fisheries, and parts of the broader economic, societal, and natural environments in which they are embedded” according to FAO. Today, food and agribusiness represent 35 percent of all jobs globally and close to 10 percent of global GDP, with the world’s farmers producing enough food to feed up to 10 billion people, according to WEF.

At the same time, global food systems are becoming increasingly less resilient to external shocks and less fit for purpose. In fact, food systems globally account for 30 percent of greenhouse gas emissions, 70 percent of global freshwater withdrawals and contribute to biodiversity loss related to deforestation. Environment issues are not the only challenge in this equation: food systems still struggle to provide universal food security and healthy diets due to inequalities, affordability issues, and unhealthy food options. According to the FAO, more than 2 billion people face food insecurity globally, with 30-35 percent of them suffering from severe hunger. Conversely, obesity affects more than 1 billion people, and dietary deficiencies are widespread, including insufficient intake of vitamins and micronutrients. Rural livelihood conditions add up to food system challenges, as two-thirds of working adults living in poverty rely on agriculture for their livelihoods.

When transformed, food systems can play a critical role in solving the world’s toughest problems, from climate change to hunger and dignified livelihoods. Promoting the compensation for ecosystem services and advancing technologies such as regenerative farming—which has the potential to sequester from 9 to 23 percent of global GHG emissions within soils according to FAO—are vital for the global food system transformation, making agriculture economically viable and environmentally responsible, as they address financial challenges faced by small producers, such as cash flow, cost of capital, and associated risk. Reshaped food systems could help build resilient communities, create opportunities to improve lives and livelihoods, including women, youth, and Indigenous peoples, and provide access to nutritious and healthy diets to an increasing population.

Aware of the pivotal role that food systems play in addressing these challenges, the Food Systems and Agriculture Task Force, which I have the honor of leading, has worked diligently over the past six months to develop a cohesive and impactful agenda. This agenda aims to unlock public policies that create the necessary conditions to catalyze the required transformation journey, strengthen institutions vital to fairer, more inclusive, and more sustainable science-based global trade, and ensure the intentional inclusion of less developed economies as well as small producers. Three major recommendations emerged from our collective effort:



- 1) Promote productivity growth through the development and scaling of advanced and sustainable solutions, securing the inclusion of less developed countries.
- 2) Build breakthrough models for financing and collaboration to support farmers' transition to resilient and sustainable food systems, monetizing the value of relevant ecosystem services delivered by regenerative and sustainable agriculture practices.
- 3) Strengthen the rules-based, non-discriminatory, inclusive, and equitable multilateral agricultural trading system, with the WTO at its core, to foster the adoption of sustainable practices and improve food security.

B20 Sustainable Food Systems and Agriculture Task Force recognizes the complexity of this transformation and the surmounting challenge of acting locally and globally in a coordinated manner. Countries are diverse among and within themselves. Local particularities must be acknowledged if we intend to be effective and promote impact. On the other hand, food system transformation is a global challenge, and nations must come together to support and enable this paradigm shift. Delivering the full potential of public-private and multi-stakeholder coordination and collaboration will be key to accelerating the transition toward better food systems.

In this context, progressing decisively, in a coordinated and holistic manner on this agenda is imperative if we are to truly combat climate change and eliminate hunger. Food systems play an indispensable role in this equation. Governments must accelerate the creation of conditions for the transformation to take place, in partnership with the private sector and other sectors of society.

The importance of Brazil in the global food systems equation and the reintroduction of this Task Force within the scope of the B20 make us believe that the G20 Brasil 2024 can be a milestone in the journey of transforming global food systems towards high-performance systems that lead to positive economic, environmental, nutritional, and health outcomes.

We hope this collective effort will contribute to building this path. This Task Force reiterates its commitment to working tirelessly to make this vision a reality.

Gilberto Tomazoni – CEO JBS

Chair of the B20 Brasil Task Force on Sustainable Food Systems & Agriculture



FOREWORDS BY THE TASK FORCE CO-CHAIRS

CO-CHAIRS

FOREWORDS



Agnes Kalibata
President, AGRA

This paper charts a course for a future where innovation and collaboration present a new pivot for sustainable agriculture. Recognizing the role and place of producers as key actors and catalyzing global action remains critical to nourishing our people and planet. It is time to scale these proven solutions for resilient, equitable food systems where food security and environmental well-being can thrive together.



Rodrigo Santos
President of Crop Science
Division, Bayer

Regenerative agriculture enabled by innovation and technology is the solution to ensure food security, mitigate climate change, and promote economic stability amid today's challenges. The B20 Brasil 2024 offers a unique platform to address these critical issues through collaboration and innovation. As co-chair of the Task Force on Sustainable Agriculture, I am honored to contribute to this essential dialogue with esteemed colleagues and industry leaders.



Miguel Gularte
CEO, BRF

Being intentional in adopting sustainable practices in food and business systems is paramount. Public policy actions that promote productivity growth, along with innovative financing models, international cooperation, and trade, are essential initiatives that will enable us to continue feeding the world while maintaining a strong focus on food security principles.



Greg Heckman
CEO, Bunge

The agribusiness and food industry faces a continuous challenge to supply growing demands without further stretching resources. We are proud to work in close partnership with other industry leaders to find the scalable solutions needed to sustainably connect farmers to consumers to deliver essential food, feed, and fuel to the world.



CO-CHAIRS

FOREWORDS



Lyu Jun
Chairman, COFCO

Our efforts have never been more important, with food production increasingly vulnerable to extreme weather and water scarcity, and people worldwide struggling to achieve good nutrition and afford the rising cost of living. Agricultural businesses must work together to help transform the food system, empower people, protect the environment, and improve farmer livelihoods through sustainable agriculture.



Livio Tedeschi
Chairman, CropLife
International & President,
BASF Agricultural Solutions

As Taskforce Co-Chair on behalf of CropLife International, I champion sustainable productivity growth through access and adoption of new technologies and innovation. This, underpinned by the imperative of free trade, will be the cornerstone of our future food security. The recommendations of this Taskforce open new possibilities for tangible progress, and I remain unwaveringly committed to the achievement of these goals.



Mr Sanjiv Puri
Chairman & Managing
Director, ITC Limited

The Food Systems Approach aims at ensuring sustainable and resilient production, food security & nutrition for the global family. It calls for an aligned and coordinated action between different stakeholders. Industry will play a key role in enabling the transformation through their active engagement in creating products and services that are affordable, sustainable, and contribute to prosperous livelihood.



Ramon Laguarta
CEO, PepsiCo

Building resilient and sustainable food systems by 2030 requires unprecedented global and cross-sector collaboration. Public-private partnerships are key to developing and scaling new technologies, supporting farmers with access to financing and services, and incorporating inclusive and cohesive trade policies to advance food security.



CO-CHAIRS

FOREWORDS



**Pelerson Penido
Dalla Vecchia**
President and CEO,
Grupo Roncador

I am a food producer, land manager, and people manager. I believe it's possible to increase productivity and improve the health of the planet. People need to be fed, and it's important in analyzing what's sustainable to consider productivity as an essential element. The development of technological innovations and research ensuring greater control and adaptability to environmental conditions is necessary, but finding ways to improve the conditions of our environment is everything. This is our quest and with the rescue of essential knowledge and a lot of technology we recognize a productive system that regenerates and improves the land year after year.

Everything is part of the grand cycle, and we are all connected and inhabiting the same home. We need to broaden our awareness so that we can take care of people and our planet.



Eng. Sulaiman AlRumaih
CEO, SALIC Group

In today's interconnected world, sustainable policymaking is crucial for the future of our planet. The food system and agriculture, at its core, embraces a comprehensive perspective that values the unique contributions of all countries towards creating a more sustainable future. While interpretations of sustainability may differ globally, our unified efforts toward a global consensus bring us together in a common goal: to build connections, promote cooperation, and tackle sustainability challenges collectively. By advancing our proposed policies together, we can pave the way towards transforming our agricultural food system into one that is more sustainable and resilient.





RECOMMENDATIONS: EXECUTIVE SUMMARY

Executive Summary



High-performing food systems lead to positive economic, environmental, nutritional, and health outcomes. They provide healthy and nutritious diets, create dignified livelihoods for producers, and benefit the economy. They mitigate and adapt to climate change, and safeguard nature and biodiversity. Today, our food systems fall far short of these goals, leading to both hunger and obesity, low resilience to external shocks, and negative impacts on climate and nature. When transformed, they can play a critical role in solving the world's toughest problems, from climate change to dignified livelihood.

The transformation pathway and levers are, at a high level, well-known: the global community must adopt and scale more sustainable agricultural practices, innovate throughout the agrifood chain, change how and what we consume, focus public policies, and build robust and science-based regulations and frameworks, take new approaches to financing, and collaborate across public and private sectors. How to unlock this transformation, pull these levers, and coordinate them at a local-global scale and required pace are the key challenges. In this context, G20 offers a great opportunity to reinforce key priorities, build consensus, and progress in this strategic and urgent agenda.

B20 Sustainable Food Systems and Agriculture Task Force recognizes the complexity of this transformation and the surmounting challenge of acting local-global coordinately. Countries are diverse among and within themselves. Local particularities must be acknowledged if we intend to be effective and promote impact. On the other hand, food system transformation is a global challenge, and nations must come together to support and enable this paradigm shift. Delivering the full potential of public-private and multi-stakeholder coordination and collaboration across agrifood chains will be key to accelerating the transition toward better food systems.

Luckily, structural elements are common to every single nation and local producer in this transformation pathway. This Policy Paper focuses on them and provides clear recommendations and policy actions for G20 governments to progress and accelerate this urgent agenda. We have fewer than six annual planting cycles left to build more sustainable, inclusive, and healthy food systems by 2030 – in line with the targets in the Paris Agreement and the UN's Sustainable Development Goals (SDGs).

Recommendations and Policy Actions

Recommendation 1: Foster productivity growth through the development and scaling of advanced, sustainable, and resilient technologies—such as regenerative agriculture, biotechnologies, and digital technologies—as well as agronomic technical assistance to producers, that combined tackle the nexus of the climate, environment, resilience, food security, and affordability/access, securing the inclusion of the least developed countries (LDCs).

- **Policy Action 1.1: Foster scalable and science-based innovation, facilitating producers' access to new technologies and agronomic technical assistance to tackle the nexus of the climate, environment, resilience, food security, and affordability/access.** G20 members should invest and cooperate to foster innovation, facilitate access to the benefits of scientific progress, and promote its adoption on a global scale while recognizing countries realities and needs.
- **Policy Action 1.2: Promote a more equitable, sustainable productivity growth cycle.** G20 members should support LDCs' productivity growth by incentivizing sustainable and resilient innovations through knowledge sharing, technology dissemination, capabilities building, and international financing schemes to ensure a more inclusive global food system transformation, improve livelihoods, and increase food security.



Recommendation 2: Build breakthrough models for financing and collaboration to support farmers' transition to resilient and sustainable food systems.

- **Policy Action 2.1: Secure sufficient, efficient, and inclusive capital allocation for a rapid, large-scale transition.** G20 members should use blended financing mechanisms, improve financial capabilities and offerings—de-risking and incentivizing investments—and repurpose agricultural support to accelerate the transition towards more resilient, sustainable, and equitable food systems.
- **Policy Action 2.2: Monetize the value of relevant ecosystem services delivered by regenerative and sustainable agriculture practices, including improved resilience and environmental outcomes.** G20 members should develop a regulatory framework to accelerate the development of high-integrity, interoperable credits for ecosystem services (e.g., carbon sequestration, healthy soils, freshwater use and pollution reduction, biodiversity conservation, etc.).

Recommendation 3: Strengthen the rules-based, non-discriminatory, inclusive, and equitable multilateral agricultural trading system, with the WTO at its core, to foster the adoption of sustainable practices and improve food security.

- **Policy Action 3.1: Advance the WTO's rules-based multilateral agricultural trading system, eliminating market distorting barriers, while orchestrating sustainable practices adoption over time and guaranteeing food security.** G20 members should foster global convergence on science and outcome-based sustainable food trade regulatory practices, methodologies, and taxonomies, anchored on the international trading system with WTO, and its international standard setting bodies, at its core.
- **Policy Action 3.2: Support actionable, science- and rules-based measures to enable sustainable practices adoption while facilitating market access within the advancements of the WTO's rules-based multilateral agricultural trading system.** G20 members should foster the adoption of sustainable practices and facilitate market access by improving the efficiency of international standard-setting bodies and ensuring transparency through traceability and certification schemes.





INTRODUCTION



Introduction

Food systems are complicated combinations of interrelated and interdependent social, economic, environmental, and political systems. As defined by the Food and Agriculture Organization of the United Nations (FAO), “food systems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded.”¹ (1). Those products originated from agriculture, livestock, forestry and fisheries and are a critical part of nations’ broader economy, society, and environment. Today, food and agribusiness represent 35 percent of all jobs and close to 10 percent of global GDP² (2), with the world’s farmers producing enough food to feed up to 10 billion people, according to WEF (2023)³ (3).

In fact, global food systems are an impressive human accomplishment. Over the past five decades, food systems have experienced significant productivity gains attributed to an agricultural transformation often referred to as the “Green Revolution.” Food production has been revolutionized by the introduction of high-yielding crop varieties, expanded use of fertilizers and pesticides, improved irrigation structure, and mechanization. Its vast productivity gains have not only triggered substantial economic impacts across countries but have also improved food security worldwide. Productivity gain has also allowed food systems to help address other global issues, such as energy supply through the growing use of biofuels.

The flip side of this coin reveals a global food system increasingly less resilient to external shocks and less fit for purpose. In fact, food and agriculture collectively account for 30 percent of greenhouse gas emissions⁴ (7), 70 percent of global freshwater withdrawals⁵ (8) and biodiversity loss related to deforestation. These impacts are different across the globe, depending on nations’ geographical conditions and agricultural development stage. While some nations grapple with water stress, others confront deforestation challenges, for example.

The environment is not the only challenge. Global food systems still struggle to provide universal food security and healthy diets due to inequalities, affordability issues, and unhealthy food options. According to the FAO, 2.4 billion people face food insecurity, with 30-35 percent of them suffering from severe hunger⁶ (5). Oppositely, obesity affects more than 1 billion people⁷ (6), and widespread dietary deficiencies, including insufficient intake of vitamins and micronutrients. Rural livelihood conditions add up to food system challenges, as two-thirds of working adults living in poverty rely on agriculture for their livelihoods. Other nuances complement the picture as, according to the ILO, an estimated 160 million children globally toil in child labor, with 70 percent concentrated in rural agricultural areas. The picture worsens with an estimated 28 million people trapped in forced labor, many within agricultural production. Gender inequality further complicates matters, as women, who make up a significant portion of the agricultural workforce, often lack land ownership, access to credit and resources, and participation in decision-making^(8,9,10) 67; 68; 69).

1 **FAO.** Sustainable food systems Concept and framework. 2018

2 **WEF.** *Transforming food systems with farmers: a pathway for the EU.* 2022.

3 **HOLT-GIMENEZ, Eric et al.** We already grow enough food for 10 billion people and still can't end hunger. *Journal of Sustainable Agriculture*, v. 36, 2012.

4 **FAO.** Emission totals. Available at: <https://www.fao.org/faostat/en/#data/GT>.

5 **FAO.** AQUASTAT: FAO's Global Information System on Water and Agriculture. Available at: <https://www.fao.org/aquastat/en/overview/methodology/water-use>.

6 **FAO; IFAD; UNICEF; WFP; WHO.** *The State of Food Security and Nutrition in the World 2023.* 2023.

7 **UNITED NATIONS.** Over one billion obese people globally, health crisis must be reversed. 2022. Available at: <https://news.un.org/en/story/2022/03/1113312>.

8 **ILO.** Available at: <https://www.ilo.org/topics/child-labour>

9 **ILO.** Available at: <https://www.ilo.org/topics/forced-labour-modern-slavery-and-human-trafficking>.

10 **ILO.** Available at: <https://www.fao.org/reduce-rural-poverty/our-work/women-in-agriculture/en/>.



When transformed, food systems can play a critical role in solving the world's toughest problems, from climate change to hunger and dignified livelihood. Advances such as regenerative farming have the potential to sequester a significant share of global GHG emissions within soils – between 9 percent and 23 percent, according to a 2017 FAO estimate. Transformed food systems could help build resilient communities, create opportunities to improve lives and livelihoods, including for women, youth, and Indigenous peoples, and provide access to nutritious and healthy diets to a projected 9.7 billion people by 2050¹¹ (9).

Global agenda, local challenges

Despite the global nature of innovating toward a more productive and sustainable food system, the challenges faced by each country, region, and even individual farms may vary significantly due to historical, political, social, and economic reasons, as well as geographic variables, farm size, input intensification, productive assets, innovation and technology adoption, access to finance, insurance and credit, and human capital.

Different methodologies aim to classify various types of food systems and their primary challenges. However, they all fail to recognize that within a single country, different realities may coexist. While we acknowledge their intrinsic limitation, the food system archetypes' framework serves as a didactic tool to seize primary challenges across different regions and food system types, facilitating the design of tailored solutions for multiple contexts worldwide.

B20 Sustainable Food System and Agriculture Task Force is adopting the typology developed by the Global Alliance for Improved Nutrition (GAIN) and Johns Hopkins University in their Food Systems Dashboard¹². According to this framework, countries can be categorized into five types of food systems, exhibiting clear differences in performance on key outcome metrics across dimensions of food system success (nutrition, livelihoods, economy, nature, climate) – which can be seen in Exhibit 1. It is important to mention that this typology not only considers differences in terms of farms' characteristics but also in the level of integration and coordination of food-related supply chains and the maturity of farmer-allied intermediaries.

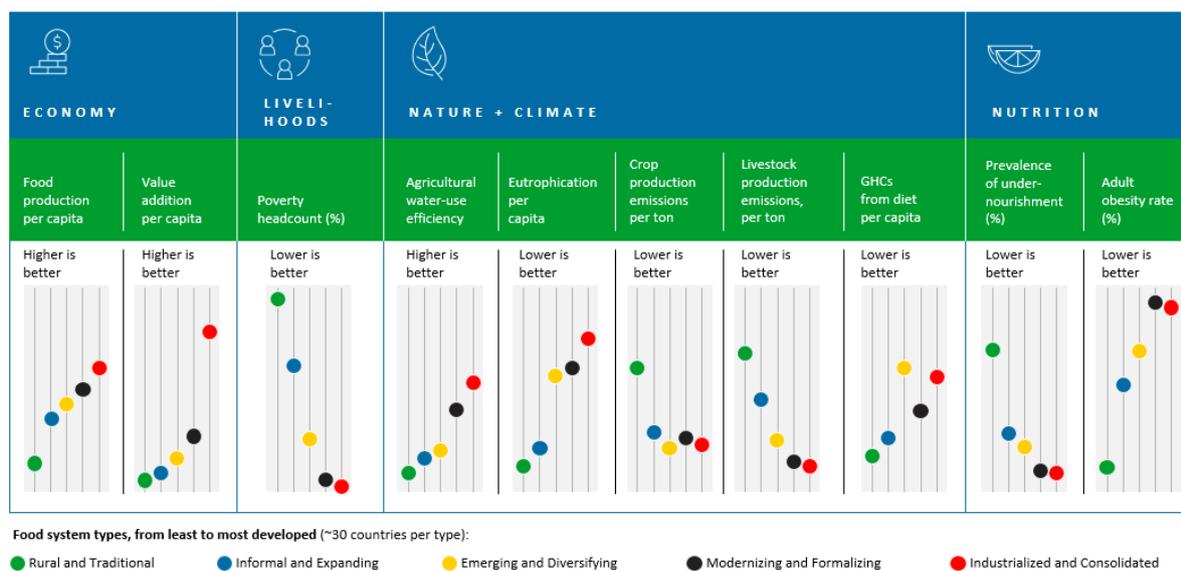
The five types of food systems range from "Rural and Traditional," which is characterized by smallholder farms, low yields, short supply chains and fragmented, informal markets, to "Industrial and Consolidated," which presents large, input-intensive farms and long supply chains with high supermarket density and luxury options.

11 UNITED NATIONS. World Population Prospects. 2022. Available at: <https://population.un.org/wpp/>.

12 THE GLOBAL ALLIANCE FOR IMPROVED NUTRITION - GAIN. *The Food Systems Dashboard*. [Online] 2023. <https://www.foodsystemsdashboard.org>.



Exhibit 1 – Across dimensions of success, current Food Systems outcomes highlight tensions for all types of countries



Source: Food, Nature and Health Transitions – Repeatable Country Models¹³
 Note: It does not include all countries in the world due to data limitations as per Exhibit 1

Promoting a paradigm shift through a pragmatic approach

Like virtually all other industries, the food and agribusiness sector face mounting demands, from tackling the long-term health consequences of unhealthy food products to creating more dignified livelihoods for producers, ensuring human rights protection, mitigating, and adapting to climate change and safeguarding nature and biodiversity. Addressing these challenges will require a pragmatic while holistic and coordinated approach that recognizes interdependencies (synergies and trade-offs), the importance of productivity growth to cope with an increasing demand for food, and the imperative of a multi-lateral cooperation to ensure that all nations and minority populations are included, and that climate challenge is effectively mitigated.

Three pillars encompass current food systems challenges described by OECD in their “triple challenge” framework¹⁴:

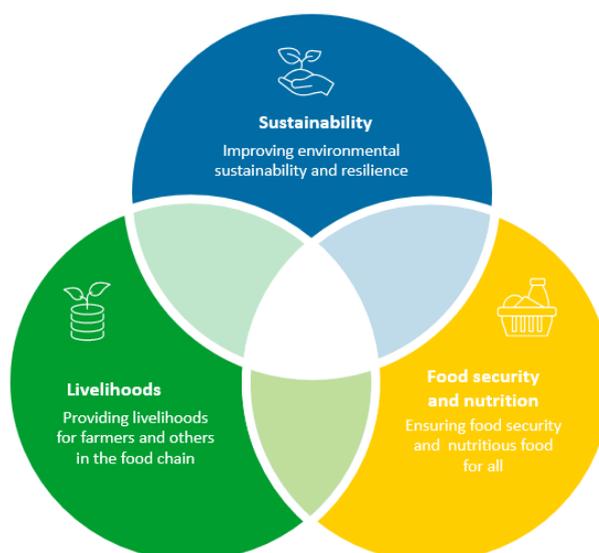
- a. Sustainability:** Improving environmental sustainability and resilience
- b. Food Security and Nutrition:** Ensuring food security and nutritious food for all
- c. Livelihoods:** Providing livelihoods for farmers and others in the food chain

¹³ WORLD ECONOMIC FORUM, BAIN & COMPANY. *Food, Nature and Health Transitions – Repeatable Country Models*. 2023.

¹⁴ OECD. *Making Better Policies for Food Systems*. 2021.



Exhibit 2 – Food systems triple challenge



Source: B20 Workgroup

B20 Sustainable Food Systems Task Force offers a set of recommendations that together indicate critical levers that must be pulled to promote the complex while urgent agricultural paradigm shift. Combined, they can improve food security and livelihoods as well as revamp farming practices toward a more sustainable highly productive food production.

Exhibit 3 – Food Systems & Agriculture Policy Recommendations

Recommendations	Policy actions
<p>1 Foster productivity growth through the development and scaling of advanced, sustainable, and resilient technologies—such as regenerative agriculture, biotechnologies, and digital technologies—as well as agronomic technical assistance to producers, that combined tackle the nexus of the climate, environment, resilience, food security, and affordability/access, securing the inclusion of the least developed countries (LDCs).</p>	<p>11 Foster scalable and science-based innovation, facilitating producers' access to new technologies and agronomic technical assistance to tackle the nexus of the climate, environment, resilience, food security, and affordability/access. G20 members should invest and cooperate to foster innovations, facilitate access to the benefits of scientific progress, and promote adoption on a global scale while recognizing countries realities and needs.</p> <p>12 Promote a more equitable, sustainable productivity growth cycle. G20 members should support LDCs' productivity growth by incentivizing sustainable and resilient innovations through knowledge sharing, technology dissemination, capabilities building, and international financing schemes to ensure a more inclusive global food system transformation, improve livelihoods, and increase food security.</p>
<p>2 Build breakthrough models for financing and collaboration to support farmers' transition to resilient and sustainable food systems.</p>	<p>21 Secure sufficient, efficient, and inclusive capital allocation for a rapid, large-scale transition. G20 members should use blended financing mechanisms, improve financial capabilities and offerings—de-risking and incentivizing investments—and repurpose agricultural support to accelerate the transition towards more resilient, sustainable, and equitable food systems.</p> <p>22 Monetize the value of relevant ecosystem services delivered by regenerative and sustainable agriculture practices, including improved resilience and environmental outcomes. G20 members should develop a regulatory framework to accelerate the development of high-integrity, interoperable credits for ecosystem services (e.g., carbon sequestration, healthy soils, freshwater use and pollution reduction, biodiversity conservation, etc.).</p>
<p>3 Strengthen the rules-based, non-discriminatory, inclusive, and equitable multilateral agricultural trading system, with the WTO at its core, to foster the adoption of sustainable practices and improve food security.</p>	<p>31 Advance the WTO's rules-based multilateral agricultural trading system, eliminating market distorting barriers, while orchestrating sustainable practices adoption over time and guaranteeing food security. G20 members should foster global convergence on science and outcome-based sustainable food trade regulatory practices, methodologies, and taxonomies, anchored on the international trading system with WTO, and its international standard setting bodies, at its core.</p> <p>32 Support actionable, science- and rules-based measures to enable sustainable practices adoption while facilitating market access within the advancements of the WTO's rules-based multilateral agricultural trading system. G20 members should foster the adoption of sustainable practices and facilitate market access by improving the efficiency of international standard-setting bodies and ensuring transparency through traceability and certification schemes.</p>

Source: B20 Workgroup



The levers are clear. Moving to action and accelerating the transformation are the real challenges. In this context, policymakers will have to navigate complex interdependencies and deploy a pragmatic and holistic set of incentives and regulations to foster coordination amongst food value chain stakeholders – from farmers to traders, processors, manufacturers, packers, retailers, and financial services, as well as public and third sectors – and unlock sustainable practices adoption, across the globe.

The G20 can play a pivotal role in addressing these challenges once critical levers for this transformation requires international cooperation as well as common and science-based frameworks that recognizes the complexity of this transformation across the globe and accounts for regional nuances, both in the point of departure and in the role on climate change mitigation. This collaborative approach can lead to the development of well-informed, science-based and cohesive policies that contribute to a more sustainable, resilient, and equitable global food system.

This transformation is paramount and urgent. When transformed, food systems can disproportionately contribute to solving the toughest world's challenges – poverty, hunger, and climate change. As highlighted by the UN Food System Summit in 2021, there is a mutual dependency between all Sustainable Development Goals (SDGs) and resilient and well-functioning food systems¹⁵. The global community must recognize this strategic role and make sound and steady progress in the recommended agenda.

15 FOOD SYSTEMS SUMMIT. **Member State Dialogue Convenors and Pathways**. 2021. Available at: <https://summitdialogues.org/engage/dialogue-convenor/>.



RECOMMENDATION 1



Recommendation 1



Recommendation is aligned with previous B20 editions

Recommendation 1: Foster productivity growth through the development and scaling of advanced, sustainable, and resilient technologies—such as regenerative agriculture, biotechnologies, and digital technologies—as well as agronomic technical assistance to producers, that combined tackle the nexus of the climate, environment, resilience, food security, and affordability/access, securing the inclusion of the least developed countries (LDCs).

Policy Actions

Policy Action 1.1: Foster scalable and science-based innovation, facilitating producers' access to new technologies and agronomic technical assistance to tackle the nexus of the climate, environment, resilience, food security, and affordability/access. G20 members should invest and cooperate to foster innovation, facilitate access to the benefits of scientific progress, and promote its adoption on a global scale while recognizing countries realities and needs.

Policy Action 1.2: Promote a more equitable, sustainable productivity growth cycle. G20 members should support LDCs' productivity growth by incentivizing sustainable and resilient innovations through knowledge sharing, technology dissemination, capabilities building, and international financing schemes to ensure a more inclusive global food system transformation, improve livelihoods, and increase food security.

To monitor the impacts of Recommendation 1, the task force examined various existing indicators and the coverage they provide for G20 countries. As a result, we have proposed three **leading monitoring KPIs** that are widely tracked and relate to our main goals from Recommendation 1: productivity, sustainability, and livelihoods. The task force also identified two **aspirational KPIs** that have a more direct and holistic connection to the recommendation but that were deprioritized due to data availability limitations. Finally, we have compiled a list of more **tactical leading KPIs** related to specific levers, which can be employed as needed to track progress and assess the effectiveness of the interventions.

Indicators Methodology

To monitor the impact of each recommendation, the task force comprehensively reviewed existing indicators and their applicability to G20 countries. We subsequently developed three distinct categories of Key Performance Indicators (KPIs) to be applied as needed for each recommendation.

- a. Key Performance Indicators:** These focus on readily trackable indicators that are demonstrably linked to the core objectives of each Recommendation.
- b. Aspirational KPIs:** These KPIs are also directly aligned with the recommendation, but data availability or robustness may currently be limited.
- c. Tactical KPIs:** These are more operational KPIs that provide a more granular view of specific aspects within the recommendations and associated policy actions.



Key Performance Indicators ¹⁶	Baseline	Target	Classification
Agriculture, forestry, and fishing, value added per worker (constant 2015 US\$) – World / LDCs¹⁷ <i>Source: World Bank</i>	4,035 / 974 (2019)	6,958 / 1,916 (2030)	 New indicator
Prevalence of moderate or severe food insecurity (percentage of population) – World / LDCs <i>Source: FAO</i>	29.5% / 59.3% (2021)	0% / 0% (2030)	 New indicator
Emission intensity of food products¹⁸ (CO₂eq / kg) – World <i>Source: FAO</i>	Based on product type	43% reduction based on product type	 New indicator

Aspirational KPIs: The task force also acknowledges the relevance of two additional indicators to Recommendation 1, but due to limited data collection, they were not included in the proposed KPIs list.

- a. The first monitors the three elements of productivity, sustainability, and farmers’ livelihoods: **SDG indicator 2.4.1** “Proportion of agricultural area under productive and sustainable agriculture.” This indicator summarizes the main goal of our recommendation, covering the three pillars of sustainability (economic, social, and environmental) through a set of 11 sub-indicators.
 - i. Economic indicators:
 1. Land Productivity – Farm output value per hectare
 2. Profitability – Net farm income
 3. Resilience – Risk mitigation mechanisms
 - ii. Environmental indicators:
 1. Soil Health – Prevalence of soil degradation
 2. Water Use – Variation in water availability
 3. Fertilizer Pollution Risk – Management of fertilizers
 4. Pesticide Risk – Management of pesticides
 5. Biodiversity – Use of biodiversity-supportive practices
 - iii. Social indicators:
 1. Decent Employment – Wage rate in agriculture
 2. Food Security – Food insecurity experience scale (FIES)
 3. Land Tenure – Secure tenure rights to land
- b. The second monitors farmers’ livelihoods with a more specific focus than overall food insecurity: **SDG indicator 2.3.2** – Average income of small-scale food producers.
- c. The task force recommends joint efforts to start monitoring these indicators on a regular basis and at a country level for the next years. These aspirational KPIs serve not only as means to track progress at the required pace but also as guidelines that inspire public policies and ensure we are heading in the right direction toward a more productive, sustainable, and inclusive food system.

Tactical leading KPIs: The task force also recommends monitoring some leading indicators in order to track the implementation of policy actions and their short-term and/or specific impacts across different dimensions:

- a. **Productivity indicators:**
 - i. Value of agricultural production per agricultural land area, monitored by FAO
 - ii. Total factor productivity (TFP), monitored by USDA

¹⁶ Values displayed are the most current value for the target and target’s starting point. Each target has a different methodology for calculation.

¹⁷ Baseline Year: 2015, Baseline values: World US\$ 3,479 | LDCs US\$ 958

¹⁸ The GHG emissions used in the computation of the FAOSTAT Emissions Intensities indicator correspond to those generated within the farm gate. Additional emissions from upstream and downstream production and consumption processes and trade are excluded due to the lack of granular information needed for this analysis.



b. Environmental indicators:

- i. Agriculture water use efficiency, monitored by FAO
- ii. Proportion of agricultural land area that has achieved an acceptable or desirable level of soil degradation, monitored by FAO
- iii. Forest area annual net change rate, monitored by FAO

c. Innovation indicators:

- i. Percentage of individuals using the Internet, by urban/rural area, monitored by ITU
- ii. Agricultural knowledge and innovation system government expenditure, monitored by OECD

SDGs

Recommendation 1 contributes to the achievement of the following UN SDGs:



Recommendation 1 contributes to SDG 2 – **End hunger, achieve food security and improved nutrition, and promote sustainable agriculture** – particularly SDG 2.1 “End Hunger and Ensure Access to Safe, Nutritious, and Sufficient Food All Year Round”, SDG 2.2 “End All Forms of Malnutrition”, SDG 2.3 “By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment,” SDG 2.4 “By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality” and SDG 2.a “Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.”

Recommendation 1 contributes to SDG 13 – **Take urgent action to combat climate change and its impacts** – particularly SDG 13.2 “Integrate climate change measures into national policies, strategies and planning,” SDG 13.b “Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.”

Recommendation 1 contributes to SDG 17 – **Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development** – particularly SDG 17.2 “Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of ODA/GNI to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries; ODA providers are encouraged to consider setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries,” SDG 17.6 “Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism” and SDG 17.7 “Promote the development, transfer, dissemination and diffusion of environmentally sound



technologies to developing countries on favorable terms, including on concessional and preferential terms, as mutually agreed.”

In a more comprehensive manner, **Recommendation 1** also contributes to **SDG 1 End poverty in all its forms everywhere**, **SDG 6 Ensure availability and sustainable management of water and sanitation for all**, **SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**, **SDG 12 Ensure sustainable consumption and production patterns**, and **SDG 15 Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**.

Relevant B20 Brasil Guiding Claims

Recommendation 1 has the strongest impact on three B20 Brasil Guiding Claims:



Promote inclusive growth and combat hunger, poverty and inequality



Accelerate a fair net-zero transition



Increase productivity through innovation

Recommendation 1 also presents a relevant impact on the other two Guiding Claims. Scaling sustainable and resilient technologies, encompassing smallholder farmers and LDCs will also, “Foster the resilience of global value chains” and “Enhance human capital.” The strongest and most direct correlations, though, are to the three axes highlighted in this section.

Relevant G20 Brasil Priorities

Recommendation 1 contributes to the following priorities of the G20 Brasil:

Two of G20 Brasil’s Agriculture Working Group key priorities.

- a. Sustainability of agrifood systems in their multiple paths.
- b. Recognizing the essential role of family farmers, peasants, indigenous people, and traditional communities in sustainable, healthy, and inclusive food systems
- c. Both priorities are well aligned with the focus of the two policy actions in the recommendation. The first policy action focuses on the sustainable transformation of food production, while the second is more concerned with promoting an inclusive transformation with significant social impacts.

Both the Global Alliance Against Hunger and Poverty Task Force’s missions:

- a. Provide sustained, political drive at the highest level by the Group of 20 and other Global Alliance Members, galvanizing collective action over other existing efforts to eliminate poverty and hunger across the world.



- b. Promote and facilitate mobilization and better alignment of international support, including financial resources and knowledge, to enable large-scale country-level implementation of policy instruments and programs that have already proven effective in advancing these goals, especially in the countries most affected by hunger and high poverty levels.
- c. Recommendation 1, primarily through its second policy action, has a clear call for action in combating poverty and hunger worldwide, utilizing international cooperation and support for this purpose.

Context

Overall context and challenges

The evolution of food systems has been significantly shaped by innovation and technology, serving as structural enablers for productivity growth. According to FAO, between 1961 and 2009, agricultural output has increased by 150-200 percent, while croplands have expanded by only 12 percent¹⁹. This remarkable progress has allowed food systems to meet the food demand of a growing global population. However, the agrifood system still faces large challenges such as environmental impacts, including increased greenhouse gas emissions linked with land use and land change, persistent food insecurity and malnutrition, and high levels of extreme poverty, mainly in least developed countries. These challenges must be intentionally tackled by the global community over the next years if poverty, hunger, and climate change want to be solved.

A paradigm shift in food systems can make a powerful and strategic contribution to solving this complex equation. In fact, food systems transformation has the potential to sequester from 9-23 percent of global GHG emissions,²⁰ reduce soil erosion by up to 80 percent²¹ and, in some cases, increase its biodiversity by 10 times²². Most importantly, this transition could increase farmers' profitability by up to 70 percent²³.

Technology and innovations are crucial allies in transforming food systems toward more sustainable, resilient, and inclusive ones while securing high levels of productivity gains and resource use optimization on supply chains to increase food security and fight hunger. Over the past decade, numerous innovations in the food and agriculture space have emerged around three major verticals, expected to drive sustainable productivity growth in the coming years: biotechnologies, digital technologies, and the adoption of regenerative agronomic practices defined as *"the system of adaptable farming practices that enhance inputs use efficiency and increase the provision of multiple ecosystem services, such as restoring soil function and microbiology, improving micro hydrology and biodiversity conservation at all levels"*^{24,25}.

According to estimates presented in the OECD FAO Agricultural Outlook 2023-2032²⁶, about 85 percent of the increase in global crop production in the next decade is expected to come from increases in yields and cropping intensity in agriculture. Low- and middle-income countries are expected to experience more significant increases due to the use of better-adapted seeds and improved crop management. High-income countries, on the other hand, are likely to see productivity gains facilitated using sustainable techniques such as the use of nitrogen-fixing crops.

19 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of the World's Land and Water Resources for Food and Agriculture**. 2011.

20 WORLD ECONOMIC FORUM, BAIN & COMPANY. **100 Million Farmers**: Breakthrough Models for Financing a Sustainability Transition. 2024.

21 XUAN Du et al. Conservation management decreases surface runoff and soil erosion. **International Soil and Water Conservation Research**, v. 10, n. 2, 2022.

22 VARAH, A. et al. Temperate agroforestry systems provide greater pollination service than. **Agriculture, Ecosystems & Environment**, v. 301, 2020.

23 LACANNE, C. E.; LUNDGREN, J. G. Regenerative agriculture: merging farming and natural resource conservation profitably. **PeerJ**. 2018.

24 FAO. Regenerative Agriculture: good practices for small scale agricultural producers. **Research and Extension - TECA Webinar**. 2021. Available at: <https://www.fao.org/documents/card/en?details=CB6018EN/>.

25 WORLD ECONOMIC FORUM, BAIN & COMPANY. **100 Million Farmers**: Breakthrough Models for Financing a Sustainability Transition. 2024.

26 OECD and FAO. **OECD-FAO Agricultural Outlook 2023-2032**. 2023.



This set of innovations, around the three pillars, are enabling a more precise, efficient, and cost-effective farming and agrifood supply chain while unlocking nature-based and regenerative agriculture solutions adoption. In fact, it is the combination of them that will unlock a high-performing global food system and tackle the nexus of the climate, environment, resilience, food security, and affordability/access.

Indeed, in developing markets, entrepreneurial innovation has resulted in advances including solar-powered micro-drip irrigation; mobile chillers and storage; biodigesters; digital learning and advisory platforms for soil, weather, and pest management; and even tractors that convert crop residue to mulch while seeding at the same time. New and more diverse crop choices and seed varieties have helped farmers adapt to climate impacts and become more resilient. Experiments in Tamil Nadu, India, found that using a remote sensing-assisted irrigation system, production could be increased by up to 40 percent²⁷. Precision agriculture and data analytics can optimize crop input use, including pesticides and fertilizers.

Another example of digital technologies being applied in agriculture is AMIS (Agricultural Market Information System), an inter-agency platform established to enhance food market transparency and encourage international policy coordination. By focusing on four main crops (wheat, maize, rice, and soybeans), AMIS provides real-time market data, production forecasts, and trade policy information, which is crucial for farmers to make informed decisions regarding crop production, marketing, and risk management. This increased transparency in agricultural markets, enabled by digital technologies, helps reduce price volatility and ensure stable food supplies, ultimately benefiting both farmers and consumers.

Box 1: Technology trends

Biotechnologies – “any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use” (Convention on Biological Diversity), such as methane-inhibiting feed additives, green fertilizers, vertical farming, bio-stimulants, and biological crop protection.

- a. Expected to continue increasing the efficiency and resilience of crop and livestock varieties, ensuring higher productivity with better use of natural resources. Most important innovations are improved seeds varieties, microbial fertilizers, and products produced by innovative technologies, like genome editing.
- b. At scale, biotechnology can be an important driver for sustainable productivity growth and can help reduce environmental impact. A meta-analysis found that adopting genetically modified crops increased yield resilience while optimizing pesticide use, resulting in resource efficiency and profit gains for farmers²⁸.

Digital technologies – platforms for digital farmer services, real-time data, artificial intelligence, remote sensors, autonomous vehicles, robotics, drones, satellites and blockchain (not exhaustive)

- a. According to WEF²⁹, digital technologies, such as precision farming, such as drones, sensors and satellites can improve farmers efficiency on inputs usage (e.g., fertilizers, water) by identifying soil moisture and nutrient levels. Additionally, farming management solutions and supply chain management tools can also improve food production, value chain efficiency, and overall farmer profitability.
- b. AI can further improve the level of control of farming processes leveraging image interpretation and robotic technologies. For example, CiBO technologies combine advanced, science-based ecosystem modeling and AI-enhanced computer vision to “simulating the performance of various crops at many scales to help farmers decide the best management practice to use on their fields.”
- c. AI/AA algorithms aid in processing by analyzing data from cameras, X-rays, and other sources to automatically sort perishable food products, reducing food waste and eliminating manual sorting inefficiencies.

27 FAO. Available at: <https://openknowledge.fao.org/server/api/core/bitstreams/002ef5c5-3501-413f-b226-c87da30a7a29/content>

28 KLÜMPER W; QAIM M. **A Meta-Analysis of the Impacts of Genetically Modified Crops**. S.I.: PLOS ONE, 2014.

29 WEF. **How is agritech helping to optimize the farming sector?** 2023. Available at: <https://www.weforum.org/agenda/2023/10/artificial-intelligence-agriculture-innovation-agritech-india/>.



The adoption of these sustainable technologies, such as the ones detailed in Box 1, is a key enabler to improve food systems environmental outcomes. Combined with appropriate technical knowledge regarding sustainable agronomic practices, their dissemination will be the basis of achieving the outcome of a regenerative agriculture system. In fact, many practices that enhance soil health, increase organic carbon fixation, boost biodiversity and integrate livestock and different crops have also emerged as possible existing solutions for more sustainable and resilient food production.^{30,31}

- a. No/minimal tillage
- b. Cover crops
- c. Retaining crop residues/leaving crop residues on soil surface
- d. Nutrient management
- e. Improved crop rotations
- f. Biological solutions and additives
- g. Field borders, etc., for beneficial insects (mainly pollinators and natural enemies to pests)
- h. Intercropping
- i. Agroforestry
- j. Cultivar mixture
- k. Embedded natural infrastructure
- l. Holistically managed grazing
- m. Other practices focused on decarbonization, carbon capture and storage, or biodiversity (non-exhaustive)

In this context, fostering scalable innovation across the agrifood chain to tackle the nexus of the climate, environment, affordability/access, and nutrition is crucial to deliver food security and foster mitigation and adaptation towards climate change. Productivity remains at the heart of this new agricultural development paradigm.

Box 2: Productivity metrics

Agricultural performance can be assessed through a multifaceted lens, considering both its ability to produce and its environmental footprint. On the productivity side, metrics like value added per worker or harvested area, caloric yield, and total factor productivity (TFP) offer insights into the efficiency and output of agricultural systems. Conversely, environmental impact is evaluated through metrics that track resource use and emissions, such as water use efficiency and greenhouse gas emissions intensity. By examining these various factors, we gain a more comprehensive understanding of the strengths and weaknesses within the agricultural sector.

These diverse perspectives reveal substantial gaps among various food systems, emphasizing the need for tailored approaches to address specific challenges. It is essential to employ different metrics when analyzing different problems, ensuring a comprehensive understanding of agricultural productivity, and enabling more effective solutions to address the sector's complexities.

Barriers to technology adoption

Whether it is advancing new generations of technologies or scaling up existing solutions, the primary challenge lies not in a lack of innovation itself but rather efficiently achieving widespread global adoption, considering the nuanced and varied challenges faced by different countries, regions, and farms (e.g., MSMEs).

30 WORLD ECONOMIC FORUM, BAIN & COMPANY. **100 Million Farmers**: Breakthrough Models for Financing a Sustainability Transition. 2024.

31 EASAC. Regenerative agriculture in Europe - A critical analysis of contributions to European Union Farm to Fork and Biodiversity Strategies. **EASAC policy report**, n. 44, 2022.



Today, three main types of barriers prevent faster adoption of innovative technologies: economic, technical, and social³². Economic barriers are related to affordability, timing of value and risk/uncertainty of adopting this new set of technologies and techniques. These will be further detailed in Recommendation 2.

Although important, economic barriers are not alone. Farmers face equally important challenges on the technical and operational barriers due to the lack of access to needed agronomic advice, services, inputs, and tools, as well as a lack of farm data, metrics, and autonomy. Finally, there are social barriers related to the lack of farming community trust in programs that require major changes and/or hesitance over unconventional practices.

Exhibit 4 – Barriers to farmer adoption of regenerative agriculture

 <p>ECONOMIC BARRIERS</p>	<p>Affordability Adoption may require investments and/or result in temporary losses for growers</p> <p>Timing of value Investments and cash losses occur in the near term, benefits are commonly not realized until later</p> <p>Risk and uncertainty Unpredictability of costs and, particularly, benefits of adoption</p>
 <p>TECHNICAL AND OPERATIONAL BARRIERS</p>	<p>Access Lack of access to needed agronomic advice, training, services, inputs, equipment, labour and/or market infrastructure</p> <p>Farm data and metrics Lack of clarity over what to measure and optimize for and how to measure or track progress</p> <p>Autonomy Programs and regulations allow too little flexibility for growers to choose the most relevant practices and support</p>
 <p>SOCIAL BARRIERS</p>	<p>Trust Lack of farming community trust in programs that require major changes to how they farm</p> <p>Social dynamics Hesitance over unconventional practices and fragile leasing relationships between landowners and renter-operators</p>

Source: 100 Million Farmers – Breakthrough models for financing a sustainability transition³³

Seizing the opportunity

Sustainable productivity growth will play a central role in addressing food system challenges and it can be accelerated through the adoption of agricultural innovation – deploying new technologies and/or adopting new agronomic practices. This can improve productivity, food security and livelihoods while reducing environmental impacts. This transformation process should be inclusive, considering that fostering innovation across agrifood chains and, hence, productivity growth in least developed economies imposes additional structural challenges.

The widespread adoption of digital agriculture faces several barriers, including infrastructure and connectivity limitations, lack of digital literacy and digital competencies at regulatory agencies, data use-sharing concerns, and fragmented policy frameworks. Addressing these barriers requires cooperation and concerted efforts from governments, farmers, and the private sector to ensure equitable access to digital tools and promote inclusive agricultural transformation.

³² WORLD ECONOMIC FORUM, BAIN & COMPANY. **100 Million Farmers: Breakthrough Models for Financing a Sustainability Transition**. 2024.

³³ OECD. **Agricultural Policy Monitoring and Evaluation**. 2023.



Given the tremendous opportunities that the technological and digital transformation of agriculture brings in terms of productivity and sustainability, digital and precision farming should be on policymakers' strategic agendas. Setting the right course of action – along with incentives – can drive technology adoption, encourage technology development, and usher in a sustainable transformation of the agriculture sector. To further unlock and promote the digital transformation of agriculture, governments should bring together farmers, technology developers, policymakers, academia, and civil society to develop a common political vision and ensure policy coherence.

Additionally, aggregated demand for low-carbon, sustainable, and nutritious food must come from across the value chain. This includes innovation from industry, purchasing power of consumers, scientific validation by experts, involvement of communities and civil society, and incentives from policymakers and financial institutions. These demand priorities must also be embedded in the procurement strategies of downstream and midstream market players.

Tapping into this opportunity will, therefore, require a systemic approach, policy intervention and orchestrated government actions. At the same time, the private sector should have a vital role in innovating and accelerating adoption by testing, learning, and scaling proven technologies to achieve a sustainable and resilient productivity increase and resource use optimization across the value chain.



Policy Action 1.1

Foster scalable and science-based innovation, facilitating producers' access to new technologies and agronomic technical assistance to tackle the nexus of the climate, environment, resilience, food security, and affordability/access. G20 members should invest and cooperate to foster innovation, facilitate access to the benefits of scientific progress, and promote its adoption on a global scale while recognizing countries realities and needs.

Executive Summary

Since the 2021 UN Food Systems Summit, 117 governments have established pathways for food system transformation³⁴ (11). Recently, at COP28, more than 150 countries committed to integrating agriculture and food systems into National Adaptation Plans, Nationally Determined Contributions, Long-term Strategies, National Biodiversity Strategies and Action Plans, and other related strategies before the convening of COP30³⁵. This entire process will take decades and will require the participation of numerous stakeholders, who need security and incentives to move in the right direction. This policy action focuses on fostering innovation toward a more resilient and sustainable agriculture and food production while enabling farmer's adoption by tackling major barriers. In this sense, **G20 members should:**

- a. Promote research, R&D investments, technology adaptation, and collaboration among countries to develop and consolidate technologies and innovations and to ensure that access is facilitated through science-based regulations.
- b. Establish and replicate inclusive partnerships for the design, deployment and scaling of technologies and innovation, prioritizing adaptable, fit for purpose and affordable solutions and, thus, mitigating barriers to farmers' adoption.
- c. Facilitate adoption and scaling by investing in and fostering extension agent networks, human capital, digital platforms, and farmer advisory services for modern technologies while promoting local agronomic practices dissemination.
- d. Enhance ICT infrastructure, digital capabilities and develop interoperability of data ecosystems to offer more robust and holistic views of soil health and land use to further source and deploy knowledge and solutions.
- e. Accelerate the scaling of farmer-allied enterprises and organizations through access to capital, farmer training and supportive government policies to ensure that productivity-improving supports reach smallholder farmers.
- f. Foster (cross-border) public-private partnerships among agrifood industries, farmers, governments, and research bodies through international agreements, with the goal of defining roadmaps for country development and for innovation and technology development and adoption.

³⁴ WORLD ECONOMIC FORUM, BAIN & COMPANY. **Food, Nature and Health Transitions: repeatable Country Models.** 2023.

³⁵ COP28. **COP28 UAE Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action.** Available at: <https://www.cop28.com/en/food-and-agriculture>.



Background and Context

Technology and innovation as propellers of productivity growth

As previously mentioned, the “Green Revolution” has shifted the productivity growth paradigm. This transformation was fueled by innovations and mechanization through the intensive use of fertilizers, pesticides, monoculture, machinery, and irrigation, which created conditions in which high-yielding modern varieties could thrive³⁶. The spread of agronomic innovations and intensification across much of the planet has enabled humanity to enhance food security for a rapidly growing population.

Over the next decades, food systems will face mounting challenges. They will be required to provide enough food to feed a growing population and enhance small farmers’ livelihood through a more resilient while environmentally sustainable value chain. The bright side is that sustainable agriculture offers a viable solution to all these challenges.

At the heart of this journey toward a more sustainable and regenerative agriculture lies productivity gains and therefore innovation and technology solutions, knowledge sharing and global arrangements to foster adoption and scaling at a global level.

Moving forward on scaling a more sustainable while efficient agriculture

Overcome economic (*further detailed in Recommendation 2*), technical and social barriers will be mandatory to accelerate the adoption of new technologies and techniques³⁷. Therefore, strengthening innovation ecosystems that are (i) farmer-focused, (ii) aligned with government priorities, interventions, and incentives, (iii) well connected with other steps of the value chain that operate as demand aggregators, and (iv) have clear measurement metrics and methodologies is the right pathway to sustainable while efficient food production.

i. Farmers at the center – multiple stakeholders should align and contribute to deliver on the 4As of farmer adoption³⁸ - a repeatable model that encourages and enables farmers to adopt and scale up resilient and sustainable practices and technologies - especially advantage and affordability:

- a. Awareness:** Farmers must be informed about resilient and sustainable agronomic practices and technologies—and have access to the technical expertise and support needed to implement them.
- b. Advantage:** Farmers must have confidence that adopting new practices and technologies will deliver an attractive rate of return, both now and into the future.
- c. Access:** The right inputs, tools, equipment, and methods must be available to farmers, when and where needed.
- d. Affordability:** Farmers need reasonable upfront costs and accessible financing for technology investments, ensuring affordability and adaptability to their circumstances while minimizing adoption barriers.

ii. Government alignment – Innovations have a higher likelihood of success when aligned with government transformation priorities and when the government helps finance them with tax credits, subsidies, preferential lending, and other tools. Besides aligned priorities and financing, governments may also help create an appropriate regulatory environment, which needs to be science-based, considering benefits, safety, and risks, along with international regulatory harmonization that facilitates innovation and trade (*which will be further discussed in Recommendation 3*).

³⁶ FAO. **Towards A New Green Revolution**. Available at: <https://www.fao.org/3/x0262e/x0262e06.htm>.

³⁷ WORLD ECONOMIC FORUM, BAIN & COMPANY. **100 Million Farmers: breakthrough Models for Financing a Sustainability Transition**. 2024.

³⁸ WORLD ECONOMIC FORUM, BAIN & COMPANY. **Food, Nature and Health Transitions: repeatable Country Models**. 2023.



iii. Farmer-allied enterprise enablement – Food production can be extremely fragmented, and the value chain might have important steps missing, mainly in developing markets and/or remote areas. Farmer-allied enterprises are intermediaries that aggregate demand and play the role of trusted partners, facilitating farmers’ market and capital access that closes the productivity growth loop³⁹. They can be producer organizations, cooperatives, aggregators, processors, and vertically integrated food brands. The success of these enterprises necessitates access to capital, farmer training, and supportive government policies (including coordination regarding targeted outcomes, involved stakeholders, and deployed programs and financing instruments). Besides the typical relationships with farmers, by adopting a farmer-allied approach, intermediaries help farmers to sustainably increase productivity in four main areas:

- a. Crop choice:** Encourage farmers’ choice to grow crops coherent with market demands.
- b. Sustainable intensification:** Provide access to inputs and technical assistance – aligned with the 4As and facilitate technical assistance on agronomic practices.
- c. Market access:** Commit to long, predictable, and transparent purchase agreements while establishing a high velocity of transactions, improving farmer cash flow and supporting farmer organization, logistics and storage.
- d. Value chain participation:** Facilitate value-added activities performed by farmers, such as primary processing food manufacturing, packaging logistics, retail, and increased asset ownership.

iv. Measurement metrics and methodologies – The widespread adoption of sustainable and resilient technologies and practices in agriculture highly depends on our ability to accurately measure and validate their impacts, highlighting the pivotal role of science. However, one of the main operational barriers to the adoption of sustainable and resilient technologies and practices in agriculture is the lack of clarity over what to measure and optimize for and how to measure or track progress effectively. The “Knowledge and Innovation Observatory in Bioeconomy”⁴⁰ breaks this barrier down into three main challenges:

- a. Institutional challenge:** Underscores the necessity for clarity, coordination, and leadership on the topic. Currently there are coordination gaps among stakeholders, resulting in fragmented approaches, with no consistency, leading to decision-making difficulties.
- b. Technical challenges:** Lies in effectively developing appropriate metrics to measure sustainability concepts on both global and national scales, considering the diverse agricultural environments characterized by significant regional, cultural, and biological variations. These metrics should not only facilitate precise and consistent measurement but also enable ongoing monitoring and verification of outcomes. This is crucial for guiding effective sustainability policies and tracking progress toward established international goals.
- c. Communication challenges:** Highlights the need for effective communication strategies, including the development of robust information systems for compiling and disseminating data. These efforts are vital for ensuring the efficacy of developed methodologies and fostering a comprehensive understanding of the achieved results across stakeholders.

Although challenging, there are already important country experiences that make the positive impact tangible on the environment and on farm efficiency. All of them combined at some level the pillars described above: a farmer-centric approach, government alignment, farmer-allied companies, and clear metrics and methodologies. Canada, for instance, achieved a remarkable increase in conservation tillage practices, reaching 82 percent of cropland by 2016 from less than 40 percent in 1991⁴¹. This success hinged on a farmer-centric approach that emphasized economic benefits, cost savings and yield increase through on-farm trials and clear data. Collaboration among stakeholders and government incentives like grants significantly accelerated adoption. This approach not only improved soil health but also enhanced farm efficiency. New Zealand, facing subsidy removal, focused on efficiency gains

39 BAIN & COMPANY. [How Farmer-Allied Intermediaries Can Transform Africa’s Food Systems](#). 2020.

40 ESTEVAM, C. G.; PAVÃO, E. M.; ASSAD, E. [Quantificação das Emissões de GEE no Setor Agropecuário: Fatores de Emissão, Métricas e Metodologias](#). S.I.: FGV, 2023.

41 WEF. Available at: https://www3.weforum.org/docs/WEF_Food_Nature_and_Health_Transitions_2023.pdf.



in livestock farming through improved breeding and feeding practices, increasing yield per animal and reducing livestock emissions intensity. While absolute emissions reduction remains a challenge, these examples showcase how efficiency gains can deliver positive environmental impacts alongside economic benefits for farmers.

Box 3: Producer Driven Transformation

Brazil

In the last two decades, sustainable intensification has been happening in Brazil with the adoption of Integrated crop-livestock-forestry systems (ICLFS). This agricultural production strategy integrates different production systems, namely agriculture, animal farming, and forestry within the same area to achieve economic and environmental benefits. The Brazilian model of tropical agriculture – which keeps the soil in use year-round, makes it possible to increase at the same time as agricultural production and carbon sequestration⁴². Moreover, due to the large variety of crops and cattle that can be used for ICLFS, it can be adapted for small, medium, and large properties in all Brazilian biomes⁴³.

By adopting this practice and actively monitoring soil organic matter and biodiversity levels, a large-scale Brazilian producer, the Roncador group, serves as a prime example of how to transform the way production relates to land use. Their transition from extensive livestock farming to integrating soybean and corn cultivation, has drastically increased food productivity in the same area – more than 15 times the previous volume. Furthermore, adopting regenerative practices such as no-tillage, using bio inputs, and employing various agronomic techniques has not only restored soil health but also increased biodiversity and led to carbon sequestration in the soil, which have been actively monitored in a partnership with Embrapa researchers. Over a span of 15 years, these transformative measures have established a significantly more productive, sustainable, and resilient agricultural system for the group.

42 NICOLOSO, R. S.; RICE, C. W. Intensification of no-till agricultural systems: An opportunity for carbon sequestration. *Soil Science Society of America Journal*, v. 85, 2021.

43 THE WORLD BANK. *Water in Agriculture*. Available: <https://www.worldbank.org/en/topic/water-in-agriculture>.



Policy Action 1.2

Promote a more equitable, sustainable productivity growth cycle. G20 members should support LDCs' productivity growth by incentivizing sustainable and resilient innovations through knowledge sharing, technology dissemination, capabilities building, and international financing schemes to ensure a more inclusive global food system transformation, improve livelihoods, and increase food security.

Executive Summary

This policy action focuses on enhancing agricultural productivity and transforming food systems in LDCs, which is essential for improving livelihoods and combating hunger and poverty worldwide, especially since food insecurity levels present staggering levels in those regions. **Therefore, G20 members should:**

- a. Map clear areas for global cooperation (e.g., innovation tailored for local crops/soil, technical operations, etc.) based on a country-regional and farmer-centered roadmap for food systems transformation, encompassing the whole food value chain.
- b. Leverage international cooperation to secure appropriate resources, technical knowledge sharing, and capability building, enabling an inclusive food system transformation.
- c. Accelerate the scaling of farmer-allied enterprises and organizations through access to capital, farmer training, public-private partnerships, and supportive government policies. This will ensure that productivity-improving support reaches smallholder farmers and fosters the consolidation of food supply chains, especially in least developed countries.

Background and Context

Agricultural productivity gap

It is well established in the literature the role of productivity growth in meeting both objectives of eradicating global hunger and aligning agriculture with the Paris Agreement's greenhouse gas emissions reduction goals. More precisely, as highlighted by the OECD and FAO Outlook, productivity must increase by 28 percent on average if we want to deliver on these targets by 2030⁴⁴.

The challenges of tapping into this sustainable and inclusive productivity growth cycle are different across the globe due to multiple factors that lead to distinct food system outcomes. The case of least developed countries is particularly important when it comes to food security and fighting hunger.

Food systems in countries classified as "Rural and Traditional" or "Informal and Expanding," according to the Food Systems Dashboard⁴⁵, are dominated by smallholder farms, typically no larger than two hectares. They are characterized by relatively low productivity, fragmented supply chain, substantial food losses and, consequently, face higher levels of poverty and food insecurity. As previously noted, the median productivity in Rural and Traditional countries is 40 percent of what is observed in the most developed markets, with roughly 90 percent of the population living on less than \$5.50 a day⁴⁶. Adopting different grouping criteria, the top 10 percent of the richest countries produce about 70.4

⁴⁴ OECD; FAO. [OECD-FAO Agricultural Outlook 2022-2031](#). 2022

⁴⁵ THE GLOBAL ALLIANCE FOR IMPROVED NUTRITION (GAIN). [The Food Systems Dashboard](#). 2023. Available at: <https://www.foodsystemsdashboard.org>.

⁴⁶ WORLD ECONOMIC FORUM, BAIN; COMPANY. [Food, Nature and Health Transitions: repeatable Country Models](#). 2023.



times as much agricultural value added per worker as the bottom 10 percent⁴⁷. These figures are crucial in highlighting the significant gaps and disparities in food systems outcomes across different regions and the additional structural challenges, such as lack of infrastructure (e.g., lack of refrigeration and storage facilities), low access to finance, insurance, and credit, limited human capital and R&D resources, and others, that need to be addressed in those countries.

The economic importance of agrifood systems in these countries cannot be overstated. Agriculture, forestry, and fishing in LDCs⁴⁸ contribute 4.5 times more to GDP than the global average, indicating solving for productivity improvement and value addition would have a disproportionately positive impact on these nations⁴⁹.

In that sense, food systems transformation is, first and foremost, an economic one. The low productivity negatively impacts income levels, and when combined with seasonal fluctuations in food prices and global warming trends, exposes the population to higher levels of poverty, staggering food insecurity rates (70 percent of the population facing moderate to severe food insecurity in some countries⁵⁰), and natural disasters, like water scarcity and drought. In fact, according to the United Nations, 17 out of the 20 countries most affected by climate change are located in Africa (where Rural and Traditional food systems are predominant), with North and West Africa being highly vulnerable to 1.5C – 3.0C expected temperature increase⁵¹.

In this context, increasing farm output and productivity by promoting sustainable intensification of agriculture can lead to greater food security and reduced emissions intensity at the same time. When paired with fair farm gate prices, it can not only improve farmer livelihoods but can also serve as a stepping-stone to broader rural transformation. With greater commercialization and marketable surpluses, output markets develop, and the economic value associated with activities beyond the farm gate increases. Private enterprises become an important force for the economic development and transformation of a country, further improving farmer livelihoods and creating jobs while providing more affordable nutrition for the local population⁵².

While agricultural development has enormous benefits on multiple food system dimensions, least developed markets should pursue this pathway well-aligned with the most sustainable technologies and techniques, avoiding replication of a productivity growth pattern that might fail in tackling the food system's triple challenge. In other words, intentionally integrating these countries into the new sustainable productivity growth cycle is mandatory through holistic transformation plans that avoid such unintended negative consequences and consider their targets and commitments on international treaties mandatory if we want to tackle hunger, improve farmers' livelihood, and promote positive outcomes to the environment out of the agriculture production.

Food systems roadmaps for LDCs

As mentioned in Policy Action 1.1, to achieve the required transformation and grow food systems productivity sustainably, we need to strengthen innovation ecosystems that are farmer-focused while ensuring that innovations are aligned with government priorities and incentivized through taxes, credits, subsidies, preferential lending, etc., and are accessible to all and not harmful to the environment. Another element comes into play to unlock innovation and scale up solutions toward more sustainable productivity growth: farmer-allied enterprise enablement, which means enterprises across the value chain can play a role as trusted intermediaries, reducing farmer risk concerns through offtake agreements and/or pricing premium policies. In fact, a well-functioning farmer-allied ecosystem can unleash the potential to deliver and sustain greater and better outcomes across food system dimensions.

47 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.

48 The United Nations defines least developed countries (LDCs) as countries that have low levels of income and face severe structural impediments to sustainable development. Out of the 30 countries with Rural and Traditional food systems, 24 are in the UN LDCs list

49 FAO. **Macro Indicators.** FAOSTAT. Available at: <https://www.fao.org/faostat/en/#data/MK>.

50 THE GLOBAL ALLIANCE FOR IMPROVED NUTRITION - GAIN. **The Food Systems Dashboard.** 2023. Available at: <https://www.foodsystemsdashboard.org>.

51 UNECA. **Transition to renewable resources for energy and food security in North and West Africa.** 2023.

52 WORLD ECONOMIC FORUM, BAIN & COMPANY. **Food, Nature and Health Transitions: repeatable Country Models.** 2023.



Globally, more than 90 percent of the 608 million farms are family-owned, with 84 percent of these farms covering less than two hectares of land⁵³. In the case of LDCs, small- and medium-size enterprises (SMEs) play an even more critical role in the productivity gain and value addition equation. Besides farm size, additional factors such as insufficient infrastructure leading to market inaccessibility and the absence of companies engaging in essential functions such as transportation, processing, and storage within this supply chain, collectively hinder farmers' adoption efforts in LDCs. This results in a vicious circle, where farmers are unable to increase productivity and access new markets, struggle with high levels of food losses, and thus perpetuate elevated poverty and food insecurity levels.

These companies are aggregators, logistics players, processors, and vertically integrated brands. Successful SMEs have become anchors of a more resilient and profitable value chain by building inclusive sourcing models that improve the livelihood of farmers and provide greater income opportunities for off-farm employment, especially women and youth (Bain & Company, 2020⁵⁴; FAO, 2023⁵⁵). Being intentional about SMEs is key given that they are often excluded from the mainstream policy programs and investments, as highlighted by The Alliance for a Green Revolution in Africa (AGRA), which termed them as the "hidden middle."

Another aspect that is critical to drive sustainable productivity growth in LDCs is the government's role. On one hand, governments are always critical to enabling policies and regulatory frameworks, on the other hand, in the case of LDCs, their role is broader and more foundational, ranging from elaborating a clear, sizeable, and targeted public investment to sustainable intensification to fostering global cooperation and agreements to unlock funding and markets to mitigate risks and sustain the transformation.

More precisely, as demonstrated by WEF and Bain & Company (2023)⁵⁶, the process of developing integrated food systems transformation roadmaps begins by setting clear mid- and long-term targets for all food system dimensions, tailoring them to each country's particular context. This requires a significant degree of inter-ministerial cooperation, with government ministries overseeing food and agriculture, trade and industry, environment and land use protection, consumer health and safety, and finance collaborating on priorities while managing trade-offs and tensions. Moreover, LDCs' food systems roadmaps should also focus on tailoring the 4As of farmer adoption—awareness, advantage, access, and affordability—to LDCs' specific contexts, which are often characterized by limited resources, infrastructure constraints, and environmental vulnerabilities. The process of ensuring access, specifically, requires policymakers to be capable of creating a science-based regulatory environment harmonized with international regulations, enabling farmers to access increasingly efficient, safe, and sustainable technologies (which will be further discussed in Recommendation 3).

It is important to emphasize that integrated food systems transformation roadmaps must encompass all stages of the agriculture and food systems value chain, including the need for investments and enhancements in supply chains, processing, and distribution. By building comprehensive roadmaps, countries will be able to harness the benefits of productivity gains without exacerbating food loss and waste issues – which, globally, account for approximately one-third of global food production.

Underpinning governmental alignment, LDCs need to incorporate long-term public sector commitments and investments, which will be essential for achieving the established targets and goals, such as following the CAADP recommendation of allocating 10 percent of government budgets to agriculture in African countries⁵⁷. However, due to limited investment capacity, LDCs must also explore private and international funding sources, including climate finance aligned with Paris Nationally Determined Contributions. This may include coordinated efforts by international financing institutions to restructure sovereign debt in ways that support food system transitions, as highlighted by the COP27 agreement on a new Loss and Damage Fund for vulnerable countries.

53 LOWDER, S. K.; SÁNCHEZ, M.V.; BERTINI, R. Which farms feed the world and has farmland become more concentrated? *World Development*, v. 142, 2021.

54 BAIN & COMPANY. *How Farmer-Allied Intermediaries Can Transform Africa's Food Systems*. 2020.

55 FAO, IFAD, UNICEF, WFP and WHO. *The State of Food Security and Nutrition in the World 2023*. 2023.

56 WORLD ECONOMIC FORUM, BAIN; COMPANY. *Food, Nature and Health Transitions: repeatable Country Models*. 2023.

57 NEW PARTNERSHIP FOR AFRICA'S DEVELOPMENT - NEPAD. *Guidelines: CAADP Country Implementation under the Malabo*. 2016.



The nature of these investments must evolve to support a broader food systems agenda, focusing on environmentally conscious physical infrastructure, digital and data commons, and human infrastructure to enable the transformation of food systems through technology solutions and local capability building. In this sense, international initiatives for collaboration and knowledge sharing can also be key levers for ensuring that food systems achieve the required transformation, resulting in improved livelihoods and combating hunger.

Box 4: Country experiences

Ethiopia

Ethiopia stands out as a remarkable example where strategic investments in infrastructure have significantly amplified the impact of improved inputs, fostering more sustainable and resilient economic growth. The government's commitment to allocating a substantial portion of its spending to agriculture, exceeding 10% as per CAADP recommendations, has been pivotal in catalyzing the transformation of food systems and agriculture-led economic development. These investments, coupled with targeted enhancements in inputs, have been bolstered by infrastructural developments such as soil mapping and extension services, facilitating more sustainable and climate-smart agricultural practices, thereby boosting production and productivity.

Furthermore, institutional innovation, notably through the establishment of the Ethiopian Agricultural Transformation Agency (ATA), has played a crucial role in building the necessary capabilities to support policy formulation, program execution, and cross-sectoral integration of solutions. Under the government's Vision 2030 for Transforming Ethiopian Food Systems, there's a comprehensive roadmap focused on achieving broader outcomes including improved nutrition, sustainable production, equitable livelihoods, and enhanced resilience. This vision entails substantial investments in data, innovation, market strengthening, and private sector engagement, with initiatives like the Agricultural Commercialization Clusters launched in 2015-16 forming integral parts of the strategy.

Vietnam

Vietnam also presents a great example of how mobilizing public investments alongside partnerships and capabilities development can unlock the dissemination of innovation within the hidden middle. The introduction of Sustainable Rice Intensification (SRI) productive techniques was enabled by the 4As of farmer adoption—awareness, advantage, access, and affordability:

- a. **Awareness:** Vietnam's Ministry of Agriculture and NGOs provided free training on SRI techniques to farmers. Early adopters shared success stories to encourage others to try the method.
- b. **Advantage:** Vietnamese universities, with government support and collaboration from Cornell, built a solid base of scientific evidence, demonstrating that SRI increases yields by 20-50 percent, using only half the water and just 10-20 percent of the typical number of seeds.
- c. **Access:** the government also ensured farmers had access to seeds via a formerly state-owned seed company while investing in irrigation infrastructure to allow carbon-reducing water techniques.
- d. **Affordability:** The government offered a one-time 30 percent price subsidy on certified seeds and attracted donor funding to support experiments in and the rollout of SRI techniques.

Around 10 years after its introduction, approximately 1.8 million Vietnamese farmers had embraced SRI techniques, marking Vietnam as the most successful country in SRI adoption.

Tanzania

Asas, a leading dairy processor in Tanzania, provides a compelling example of how farmer-allied intermediaries can transform food systems in Africa by uplifting commercially oriented smallholder farmers through:

- a. Operating milk collection stations along rural roads where Asas employees transport the milk to a chilled collection center allows smallholder farmers greater market access.
- b. Ensuring year-round purchase of quality output at fair prices, providing a steady and predictable source of income for farmers.
- c. Providing farmers with training to improve cow productivity, educating them in climate-smart agricultural practices and delivering veterinary support and inputs.
- d. Leveraging digital technology by working with an app for farmer registration and tracking, as well as a variety of farmer support services to increase reach and transfer knowledge.

Due to all the cooperation and services, smallholder farmers who work with Asas are able to increase productivity in a sustainable way and improve their livelihoods. Furthermore, by engaging in diverse activities across the dairy value chain – processing, packaging, logistics, and retail – Asas ensures high-quality milk to consumers and fosters regional economic growth and jobs.



RECOMMENDATION 2



Recommendation 2



New recommendation and topic was not covered in previous B20 editions

Recommendation 2: Build breakthrough models for financing and collaboration to support farmers transition to resilient and sustainable food systems.

Policy Actions

Policy Action 2.1: Secure sufficient, efficient, and inclusive capital allocation for a rapid, large-scale transition. G20 members should use blended financing mechanisms, improve financial capabilities and offerings—de-risking and incentivizing investments—and repurpose agricultural support to accelerate the transition towards more resilient, sustainable, and equitable food systems.

Policy Action 2.2: Monetize the value of relevant ecosystem services delivered by regenerative and sustainable agriculture practices, including improved resilience and environmental outcomes. G20 members should develop a regulatory framework to accelerate the development of high-integrity, interoperable credits for ecosystem services (e.g., carbon sequestration, healthy soils, freshwater use and pollution reduction, biodiversity conservation, etc.).

Key Performance Indicators	Baseline ⁵⁸	Target	Classification
Climate finance for agrifood systems (US\$ billion) – World <i>Source: Climate Policy Initiative</i>	28.5 (2020)	297 (2030)	 New indicator
Total development flows⁵⁹ to Agriculture, Forestry and Fishing(US\$ billion) – World <i>Source: OECD</i>	19.4 (2019)	60.3 (2030)	 New indicator

Aspirational KPIs: The task force also acknowledges the relevance of one additional indicator to Recommendation 2, which, due to limited data collection, was not included in the proposed KPIs list.

- a. (New Indicator) Ecosystem Services Market Indicator:** We propose the creation of a composite indicator to gauge the maturity of the ecosystem services market. The indicator would track the volume of ecosystem service credits traded within the market, encompassing carbon, water, and biodiversity credits, utilizing standardized metrics that account for variations between temperate and tropical climates.

⁵⁸ Values displayed are the most current value for the target and target's starting point. Each target has a different methodology for calculation.

⁵⁹ Development resource flows include measuring the inflow of resources to recipient countries through bilateral official development assistance (ODA); grants; concessional and non-concessional development lending by multilateral financial institutions; and other official flows, including refinancing loans, that are considered to be for development purposes, but which have too low a grant element to qualify as ODA



SDGs

Recommendation 2 contributes to the achievement of the following UN SDGs:



Recommendation 2 contributes to the achievement of the following UN SDGs:

Recommendation 2 contributes to **SDG 17 – Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development** – particularly SDG 17.3 “Mobilize additional financial resources for developing countries from multiple sources,” SDG 17.5 “Adopt and implement investment promotion regimes for least developed countries,” SDG 17.9 “Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation,” and SDG 17.17 “Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.”

Recommendation 2 contributes to **SDG 2 – End hunger, achieve food security and improved nutrition and promote sustainable agriculture** – particularly SDG 2.1 “End Hunger and Ensure Access to Safe, Nutritious, and Sufficient Food All Year Round”, SDG 2.2 “End All Forms of Malnutrition” 2.3 “By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment,” SDG 2.4 “By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality” and SDG 2.a “Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.”

Recommendation 2 contributes to **SDG 13 – Take urgent action to combat climate change and its impacts** – particularly SDG 13.2 “Integrate climate change measures into national policies, strategies and planning,” SDG 13.a “Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.”

In a more comprehensive manner, **Recommendation 2** also contributes to SDG 1 **End poverty in all its forms everywhere**, SDG 6 **Ensure availability and sustainable management of water and sanitation for all**, and SDG 15 **Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**.



Relevant B20 Brasil Guiding Claims

Recommendation 2 has the strongest impact on two B20 Brasil Guiding Claims:



Promote inclusive growth and combat hunger, poverty and inequality



Accelerate a fair net-zero transition

Recommendation 2 also presents relevant impact on the other three Guiding Claims. By enabling the financing of new, more resilient and sustainable technologies and productive practices, and suggesting more resources for the research, innovation, and general services environment for agriculture, the recommendation also addresses the pillars “Increase productivity through innovation,” “Foster the resilience of global value chains,” and “Enhance human capital.” The strongest and most direct correlations, though, are to the two axes highlighted in this section.

Relevant G20 Brasil Priorities

Recommendation 2 contributes to the following priorities of the G20 Brasi:

Three of G20’s Brasil Agriculture Working Group key priorities.

- a. Sustainability of agrifood systems in their multiple paths.
- b. Recognizing the essential role of family farmers, peasants, indigenous people, and traditional communities in sustainable, healthy, and inclusive food systems
- c. Recommendation 2 seeks alternatives for financing the sustainability of food systems, also making use of the recognition of the various ecosystem services they can provide, closely aligned with the first pillar. By proposing direct financing to farmers, including smallholders, the recommendation is also highly aligned with the second pillar.

Both the Global Alliance Against Hunger and Poverty Task Force’s missions:

- a. Provide sustained, political drive at the highest level by the Group of 20 and other Global Alliance Members, galvanizing collective action over other existing efforts to eliminate poverty and hunger across the world.
- b. Promote and facilitate mobilization and better alignment of international support, including financial resources and knowledge to enable large-scale country-level implementation of policy instruments and programs that were already proven effective to advance these goals, especially in the countries most affected by hunger and high poverty levels.
- c. Recommendation 2 has a particular concern for the economic sustainability of farmers, which directly impacts their livelihoods and contributes to eradicating poverty and hunger around the world. In discussing the necessary sources of financing, the recommendation also highlights the importance of international cooperation.



Context

There is a pressing imperative for a systemic transformation within global food systems, underscored by the recognition of three overarching challenges: ensuring food security and nutrition for a growing population, supporting the livelihoods of millions of farmers and downstream workers in the food supply chain, and doing so in a sustainable and resilient manner.

Promoting this transformation requires incentivizing the widespread dissemination of technologically advanced and productivity-enhancing solutions and fostering the adoption of resilient and sustainable agronomic practices, thereby establishing regenerative agricultural systems.

However, today, numerous barriers hinder the adoption and global scaling of these systems, including technical, social, and economic ones. While government alignment, intermediary support, and investment in research and extension, infrastructure, and human capital are effective measures to overcome technical and social barriers, tackling economic barriers is also mandatory to foster farmers' adoption and promote food system transformation.

Scaling regenerative agriculture can be challenging from the producers' cash flow perspective. On one hand, there is a significant set of investments in new technologies applied to production, from inputs to digitalization, as well as investments in new production techniques and services. The timing of the investment typically does not align with the return. Adding to this is the fact that part of the results generated by regenerative agriculture – ecological and ecosystem services – are still not fully monetized, making the value equation particularly challenging, especially for small producers.

To meet this demand, collaboration among public authorities, companies in the food value chain, financial institutions, and international organizations is essential. They must ensure that producers around the world have access to affordable capital and that they are rewarded for the environmental benefits they provide by building regenerative food systems. Only through such coordinated efforts can food systems become truly sustainable and equitable at a global scale. Sustainability must relate to a net positive value equation for farmers and other players from the value chain.

Economic barriers to farmers' adoption

The adoption of regenerative agriculture practices and new technologies may require significant changes in how farmers cultivate, incorporate new inputs, equipment, services, and techniques that can complement or replace tried and tested methods that farmers may have followed for decades. This is expected to lead to an increase in farm profitability in the medium-long term, often due to higher yields and/or savings from reduced use of inputs through precision agriculture and biotechnologies and equipment.

In the short term, however, farmers often must endure reductions in cash flow and profitability, due to upfront capital expenditures, growth of certain cost lines, or even temporary declines in yields as soils adjust to new practices and farmers move down the learning curve.

In summary, the economic barriers to be overcome for the adoption of new technologies and practices are focused on three main obstacles:

- a. Affordability:** Adoption of regenerative agriculture practices may require investments and/or result in temporary losses for growers. For example, a scenario modeled by Bain & Company and the World Economic Forum for the adoption of no-tillage and cover crops on a 500-acre American farm estimated that the first year of investments could consume up to 112 percent of the producer's EBITDA⁶⁰.

⁶⁰ WORLD ECONOMIC FORUM, BAIN & COMPANY. **100 Million Farmers: breakthrough Models for Financing a Sustainability Transition.** 2024.



- b. Timing of value:** Investments and cash losses occur in the near term, while benefits are commonly not realized until later. A payback of several years may be enough to discourage or even prevent growers from adopting regenerative agriculture practices. Financial products offered to farmers can often have durations that are incompatible with long-term benefits.
- c. Risk and uncertainty:** Unpredictability of costs and, particularly, benefits of adoption. The uncertainty in the magnitude and speed with which economic returns are obtained – which may be influenced by many factors such as soil attributes, climate variations, and commodity prices – can discourage farmers from adopting practices, as well as reduce the appetite of financial institutions to provide affordable financing. Many benefits generated by adoption, such as the provision of ecosystem services, are still not properly compensated, which increases risks and uncertainties and reduces the attractiveness of the overall business case.

Box 5: Ecosystem services as a potential solution to address the economic barriers

According to an USDA definition, “Ecosystem services are the direct and indirect benefits that ecosystems provide humans. Agroecosystems, rangelands, and forests provide suites of ecosystem services that support and sustain human livelihoods. [...]. When managed well, these systems can be both providers and beneficiaries of a number of additional ecosystem services, including pest control, pollination, flood protection, improved soil health, and water filtration.” According to the literature there are two natures of ecosystem services: the one coming from human activity, known as ecological services and the other one originated from natural activity, known as ecosystem services. In this policy paper, both will be treated as ecosystem services and must be monetized.

The compensation of these services, by channeling resources to farmers who adopt technologies and practices that constitute regenerative systems, helps address the three groups of economic barriers. By increasing farmers’ profitability, compensation for environmental services can provide more resources to be reinvested in modern inputs and equipment, for instance. Additional cash flows can also reduce payback periods, with upfront payments potentially offered to compensate for environmental services. With an additional revenue line, long-term risks and uncertainties can also be drastically mitigated.

In all IPCC-modeled scenarios that limit global warming to 2°C or lower by 2100, carbon dioxide removals are part of the solution⁶¹. Agrifood systems may provide this through soil carbon sequestration, reforestation, afforestation, improved forest management, and agriculture land management. To make these solutions scalable and economically viable, the development and consolidation of markets that compensate for ecosystem services are essential.

Despite its importance, the monetization of ecosystem services has mainly advanced for carbon outcomes, leaving markets for other services, such as water conservation and biodiversity enhancements in still early stages of development.

Many farmers simply do not have the resources to overcome these economic barriers – affordability, time to value, and risk and uncertainty – and to realize the medium-long-term benefits of regenerative agriculture. Without actions aimed at these three main barriers, the transformation of food systems will not happen at the scale and pace that the climate change mitigation challenge requires.

Overcoming these barriers will require from G20 new solutions that help to raise the correct amount of capital and the right combination of sources (public, private, philanthropic, etc.) as well as allocating them in an efficient and targeted manner.

Funding challenge

The volume of public support and overall investments in agriculture has grown in absolute terms in recent decades. The 2023 OECD Agricultural Policy Monitoring and Evaluation report⁶², which covers agricultural policies in 54 countries, showed a 2.5-fold increase in the value transferred by agricultural

⁶¹ IPCC AR6 WGIII. [CDR Factsheet](#).

⁶² OECD. [Agricultural Policy Monitoring and Evaluation](#). 2023.



support policies over the last two decades, resulting in a total support estimate of \$851 billion⁶³, out of which \$518 billion were paid from government budgets. To analyze not only public but also overall funding of agricultural activities, monitoring the gross fixed capital formation of the agricultural sector may be useful. This metric indicates the value of additions to fixed assets made during a specific period, such as investments in machinery, equipment, and buildings, and has also shown an upward trend. This indicator has reached globally the figure of 578 billion dollars (at constant 2015 values) in 2021, a 97 percent growth in real terms compared to 20 years ago⁶⁴. It is important to mention that this amount includes all support given to the sector, including support to both consumers and producers, subsidies, climate financing, etc.

This volume of public support, combined with private investment, has been important in developing food systems around the world, which have seen a more than 50 percent increase in total output value in real terms over the past two decades.

While it is important to recognize the efforts and progress we have observed during this period, we need to analyze whether the trajectory we have followed will transform food systems in the direction we desire and at the speed that the planet demands. For this, we need to analyze whether food systems have received a sufficient volume of capital, whether the necessary actors are being mobilized, and whether resource allocation has been well-directed and optimized. And, on top of those three lenses, it is key that we ensure that the allocation of capital is not promoting distorting measures toward rural producers.

To this purpose, the context of this recommendation will focus on the challenge of funding from three main lenses:

- a. Investment amount
- b. Investment source
- c. Investment quality

Investment amount

Achieving the required systemic transformation within food systems and capturing the benefits of such a transformation requires a significantly larger volume of financing compared to current levels – the Growing Better report⁶⁵, prepared by The Food and Land Use Coalition (FOLU), estimates that \$300 to \$350 billion will be required annually until 2030 to support this transformation.

It is important to recognize, however, that estimating the value needed for this transformation can vary based on definitions, scope, methodologies, and assumptions adopted. While the scale and complexity of the challenge may make it difficult to provide an exact figure, these estimates help us visualize the disparity between current investments and what is likely to be needed. The Landscape of Climate Finance for Agrifood Systems report⁶⁶, produced by the Climate Policy Initiative (CPI), conducted a comparative analysis between different estimates and concluded that, regardless of the methodology and source adopted, the financing gap is alarming. Current climate finance annual investments in food systems are approximately \$30 billion and will have to increase by at least seven times by 2030, according to the most optimistic estimate, or up to 40 times (pessimistic scenario) to achieve the desired outcomes.

The under-representation of food systems is clear when understanding the role of this value chain on the climate change equation, either considering the unintended negative impacts of today's model or the role food systems will play in combating hunger, mitigating climate change and biodiversity loss, to name a few. The Agriculture, Forestry and Other Land Use (AFOLU) sector receives less than 4

63 Policies in several countries suppress domestic prices for some or most commodities, generating average annual transfers of \$179 billion away from producers and resulting in a net support to agriculture of \$672 billion.

64 FAO. **Macro Indicators**. Available at: <https://www.fao.org/faostat/en/#data/MK>.

65 THE FOOD AND LAND USE COALITION. **The Global Consultation Report of the Food and Land Use Coalition**. 2019.

66 CPI. **Landscape of Climate Finance for Agrifood Systems**. s.l. : **Climate Policy Initiative**, 2023.



percent of overall climate finance, despite food systems generating 30 percent of anthropogenic GHG emissions. Moreover, a recent report from the Food System Economic Commission (FSEC)⁶⁷ estimated food systems negative externalities, including the ones related to greenhouse gas emissions, blue water use, land use conversion, nitrogen emissions, undernourishment, poverty, and unhealthy diets may cost over 10 trillion dollars annually, which reinforces the need of higher investment amount in the sector.

The FSEC report also highlights the funding challenge from a different perspective, considering the disparities of financing required by different countries. While total values were in line with those gathered by the CPI report, the study revealed that the required investments represent varying proportions of GDP across countries. High-income countries may need to allocate 0.03 percent of their GDP annually to transform food systems, whereas low-income countries may require about 2 percent of GDP.

The transformation of food systems is an extremely complex and systemic problem, making it virtually impossible to accurately determine the volume of resources that the process will require. Nevertheless, we can be certain that this volume is significantly higher than what we have dedicated today, and that cooperation among countries will be crucial to ensuring an equitable and inclusive transformation process that addresses the overarching challenges faced by food systems globally.

Investment source

Besides requiring a significant increase in investment amount, food systems' transformation will need the mobilization and coordination of various actors. Governments, development financial institutions, local financial institutions, and food value chain companies will have to collaborate to fund the sustainable transformation that global agrifood systems urgently need, including optimization of supply chains.

In 2019-20, out of the roughly \$30 billion allocated for climate financing in food systems, a considerable portion of 39 percent⁶⁸ was funded by government budgets. It is encouraging to see that one of the main drivers of change is actively involved in financing. However, the contributed sum of \$9.5 billion indicates that this support will have to grow dramatically (the more than 30-fold increase if assuming the \$350 billion Food and Land Use Coalition estimates) and, thus, suggests that involving other financing sources, mainly private sector, will be essential.

Today, food systems also receive a small fraction of development flows⁶⁹, an important tool to support economic growth, social progress, and poverty reduction in developing countries. Worldwide, development flows rose 74 percent to 354 billion dollars in the last decade, but the agriculture sector's share decreased from 4.5 percent to its lowest level of 3.8 percent in 2021⁷⁰. Keeping in mind that low-income countries will need a value equivalent to 2 percent of their GDP to finance the transformation of their food systems, the problem of this historical low becomes even more evident.

The transformation of the food system requires not only increased resources but also efficient channeling of those resources to farmers. Public funders, philanthropies, and international organizations must find ways to mobilize private sector investment more effectively. This is essential for achieving long-term sustainability and scalability. Currently, attracting private lenders to the agricultural sector remains a challenge. A report by the Landscape of Climate Finance for Agrifood Systems⁷¹ highlights this by revealing that only 12 percent of total project-level climate finance for agrifood systems came from private sources.

67 FOOD SYSTEM ECONOMICS COMMISSION. *The Economics of the Food System Transformation*. 2024.

68 CPI. *Landscape of Climate Finance for Agrifood Systems*. s.l.: **Climate Policy Initiative**, 2023.

69 Development resource flows include measuring the inflow of resources to recipient countries through bilateral official development assistance (ODA); grants; concessional and non-concessional development lending by multilateral financial institutions; and other official flows, including refinancing loans, that are for development purposes, but which have too low a grant element to qualify as ODA.

70 FAO. **Development flows to agriculture**. 2023.

71 CPI. *Landscape of Climate Finance for Agrifood Systems*. s.l.: **Climate Policy Initiative**, 2023.



Various economic actors will inevitably benefit from the establishment of regenerative agricultural systems and have a vested interest, and even duty, to support the adoption of sustainable and resilient technologies and practices. Financial institutions, for example, will be exposed to fewer default risks as the agricultural production they finance becomes more resilient. Companies in the food value chain can gain access to more competitive, resilient suppliers and a reduction in their scope 3 emissions. Water authorities could benefit from reduced nutrient runoff, which improves local water quality and reduces water treatment costs.

Investment quality

Continuing the analysis through the three proposed lenses, we need to raise more capital, raise it from multiple sources, and finally, allocate it efficiently, with targeted and inclusive approaches. When allocating this capital to the transformation of food systems, we need to ensure investment quality, which encompasses three main areas:

- a. use destination – ensure that the capital is used to promote the sustainability and productivity gains of these systems.
- b. geographic destination – guarantee that all countries have access to sufficient resources.
- c. demographic destination – distribute this capital in such a way as to include all producers involved in the food production and supply chain.

As reported by the OECD⁷², public support for agriculture already transfers hundreds of billions of dollars annually to the sector, but only a small fraction has effectively made food systems more sustainable and resilient. A similar analysis conducted by the World Bank in 2023 mentions that over 60 percent of agricultural subsidies are market-distorting, incentivizing increased production without considering its negative impacts⁷³. On the other hand, compensation for public goods, for example, which encourages positive externalities that agrifood systems must seek to provide, is still in its early stages, and from 2019 to 2021, only 0.6 percent of budgetary payments to producers monitored by the OECD were used purely for this purpose⁷⁴.

Investing in agricultural general services support – including R&D, biosecurity services, infrastructure, and other expenditures benefiting the sector overall – and innovation is essential to increase public support effectiveness. Recent studies conducted by the staff of The World Bank and the International Food Policy Research Institute indicate that public expenditures on agricultural support can reduce emissions from agriculture and land use by over 40 percent when allocated to the development and adoption of green innovations. However, available evidence indicates that governments are persistently under-investing on this front.

Moreover, as detailed in Box 5, the compensation of ecosystem services is also an important part of the puzzle for ensuring investment quality. The creation and operationalization of the ecosystem services market contribute to food systems transformation in a comprehensive way, addressing all three overarching challenges faced by the system: food security and nutrition, livelihoods of farmers, sustainability, and resilience.

In addition to being more efficient and targeted, resources must be directed toward agriculture in a more inclusive and comprehensive manner. Today, many programs aimed at financing producers marginalize SMEs. A recent study that analyzed the financing gap for SMEs in Sub-Saharan Africa, for instance, estimated it at \$80 billion⁷⁵. When access to capital is not a barrier, affordability often can be. Today, many programs that serve agricultural producers do not use basic measures to coordinate and de-risk the allocation of capital, such as creating pools of producers. With higher risks and transaction

72 OECD. [Agricultural Policy Monitoring and Evaluation](#). 2023.

73 WORLD BANK. [Detox Development: Repurposing Environmentally Harmful Subsidies](#). 2023.

74 OECD. [Agricultural Policy Monitoring and Evaluation](#). 2023.

75 BAIN & COMPANY. [How Farmer-Allied Intermediaries Can Transform Africa's Food Systems](#). 2020.



costs due to a lack of coordination, financial institutions charge SMEs interest rates of 15-30 percent⁷⁶, which are entirely incompatible with the margins of agricultural producers.

Seizing the opportunity

Addressing the multifaceted funding challenges in transforming food systems requires raising a significant volume of financing from multiple sources and allocating it efficiently with targeted and inclusive strategies.

While current public support for agriculture is substantial, only a small fraction is directed toward agricultural general services, innovation ecosystems, and investments in public goods – approximately 12.5 percent in 2020-2022⁷⁷. Repurposing public policies while engaging the private sector will be an important solution to fund the transformation.

However, the financing food systems paradigm is not only about the required investment and its allocation. Its returns are probably the most challenging aspect of the equation, and in this context, ecosystem services can be the key to unlocking regenerative agriculture adoption and crowd-in-private capital. In fact, FOLU⁷⁸ and FSEC⁷⁹ concluded that the complete transformation of food systems could return more than 10 trillion dollars annually on business opportunities and avoid hidden costs worldwide.

There are multiple sources of value once ecosystem services are unlocked. Farmers see increased resilience in production and their livelihoods improve with additional revenues from increased productivity and compensation for ecosystem services. Governments may notice social gains with increased food security and reduced spending on health; water authorities may potentially spend less on water treatment. Banks would have less risk in their investments when lending to more resilient producers and could penetrate segments that are still underexplored today. Finally, food value chain companies would have more competitive and resilient suppliers, as well as significantly reducing their scope 3 emissions.

Therefore, developing, and consolidating markets that monetize these services is a key enabler to a paradigm shift in agricultural productivity, addressing the three dimensions of the food systems triple challenge, especially the sustainability one.

The food system paradigm shift will not become a reality without directing resources in a more inclusive and comprehensive manner, ensuring that all countries, including the least developed ones, and all producers, including SMEs, are not further marginalized and have access to affordable capital. Leaving these groups behind means failing to address hunger and inclusion as well as mitigate climate change and biodiversity loss.

76 BAIN & COMPANY. [How Farmer-Allied Intermediaries Can Transform Africa's Food Systems](#). 2020.

77 OECD. [Agricultural Policy Monitoring and Evaluation](#). 2023.

78 THE FOOD AND LAND USE COALITION. [The Global Consultation Report of the Food and Land Use Coalition](#). 2019.

79 FOOD SYSTEM ECONOMICS COMMISSION. [The Economics of the Food System Transformation](#). 2024.



Policy Action 2.1

Secure sufficient, efficient, and inclusive capital allocation for a rapid, large-scale transition. G20 members should use blended financing mechanisms, improve financial capabilities and offerings—de-risking and incentivizing investments—and repurpose agricultural support to accelerate the transition towards more resilient, sustainable, and equitable food systems.

Executive Summary

This policy actions focuses on tackling the funding challenge of food systems transformation. **To achieve this goal, G20 members should:**

- a. Secure agricultural budgetary support to promote a sustainable and resilient food systems transformation.
- b. Collaborate with development financial institutions, local financial institutions, and food value chain companies to fund a sustainable transformation in agrifood systems through innovative financing and partnerships, leveraging creditor power, and adopting a farmer-allied approach.
- c. Guarantee that all stakeholders have a role in ensuring an inclusive and equitable transformation by providing access to affordable capital to LDCs and SMEs.
- d. Support local financial institutions, with the support of development financial institutions, to develop specific capabilities and financial products to provide and coordinate affordable and fit-for-purpose commercial financing to farmers.

Background and Context

Secure agricultural budgetary support to promote a sustainable and resilient food systems transformation.

As highlighted in Recommendation 1, government alignment is an essential enabler for food systems transformation since innovations have a higher likelihood of success when aligned with government transformation priorities and supported by measures such as tax credits, subsidies, preferential lending, and other tools. Many countries have recently established pathways for food system transformation and are committed to integrating agriculture and food systems into National Adaptation Plans, Nationally Determined Contributions, and other related strategies in the coming years.

This alignment is a significant step in the right direction, but it needs to be translated into practical actions, which have partially not materialized yet. In 2021, for example, explicit fossil fuel subsidies were estimated at around US\$577 billion globally⁸⁰. To put this in perspective, this amount is similar to the total explicit and implicit subsidies directed toward the entire agricultural sector. Redirecting even a small portion of this support to agriculture can undoubtedly bring us closer to the values needed for food system transformation.

⁸⁰ WORLD BANK. **Detox Development: Repurposing Environmentally Harmful Subsidies**. 2023.



Nonetheless, merely allocating resources to the agricultural sector is insufficient if not coupled with investment quality. Governments should think about redirecting budgetary support toward investing in general services, including human capital, infrastructure, R&D, and innovation, concentrating on long-term productivity and sustainability within agriculture – *detailed in Recommendation 1* – and targeting commercially oriented smallholder farmers to achieve an inclusive transformation. Moreover, general services target the sector collectively, being more equitable in principle.

Existing evidence shows a consistent under-investment by governments in the general services support to agriculture. For instance, while 54 countries analyzed by the OECD⁸¹ provided \$851 billion annually in support to the agricultural sector between 2020 and 2022, merely 12.5 percent of that support was allocated to investments in agricultural innovation, infrastructure, and other public goods, decreasing from 15-17 percent two decades prior. Notably, support for agricultural innovation accounts for only 0.6 percent of the value of agricultural production in these countries, even though it plays a crucial role in addressing the triple challenge. By shifting public funding towards general services focused on emission-reducing technologies and production methods, we can promote mitigation, encourage sustainable productivity growth, and ultimately increase farmer income. A successful example of this approach is Saudi Arabia's Agricultural Development Fund, which champions a dual approach to food system transformation: effective government policy and robust financing. The Saudi experience demonstrates the power of increased financial allocations for agriculture, leading to substantial progress in sustainability, employment, and farmer's empowerment.

A more targeted approach may be adopted by using public funding sources to generate demand and off-take for ecosystem services, which will ultimately facilitate the initiation of a self-sustaining market. These public sources play a pivotal role in establishing a strong demand signal, accelerating the process of price discovery, and implementing a price floor to ensure the stability and viability of the ecosystem services market. This approach, allied to the policies further detailed in *policy action 2.2*, may provide a robust foundation for the long-term success and growth of the ecosystem services markets, which will ensure the flow of additional financing resources, create new economic incentives and de-risk the required transition for the food systems transformation.

Collaborate with development financial institutions, local financial institutions, and food value chain companies to fund a sustainable transformation in agrifood systems through innovative financing and partnerships, leveraging creditor power, and adopting a farmer-allied approach.

As described in the context of the recommendation, public capital alone may not be sufficient for financing the transformation. Therefore, policymakers should not only repurpose public support, but should also use blended financing mechanisms and partnerships to effectively leverage private capital sources.

Governments, backed up by development financial institutions, international donors, philanthropic contributions, and impact investors, need to provide concessional capital and blended mechanisms, which include credit guarantees, interest subsidies, and first-loss vehicles.

Combined with appropriate technical assistance, these can de-risk and unlock commercial lending, helping local financial institutions, such as banking and insurance companies, to develop self-sustaining financial markets and stimulating its wider penetration in local food systems.

Moreover, these local financial institutions and food value chain companies must also collaborate to fund the adoption of sustainable technologies and practices. For both, this could include establishing explicit company-wide sustainability commitments and offering premiums for sustainable practices and products. Concerning financial institutions' relationship with farmers, it includes leveraging their creditor power to incentivize sustainable agrifood investments. For food value chain companies, it means adopting a farmer-allied approach that enhances the farmers' investment capacity, which

81 OECD. *Agricultural Policy Monitoring and Evaluation*. 2023.



may be implemented, for example, by committing to long, predictable, and transparent purchase agreements, establishing a high velocity of transactions to improve farmers' cash flow, and even facilitating access to climate finance.

Guarantee that all stakeholders have a role in ensuring an inclusive and equitable transformation by providing access to affordable capital to LDCs and SMEs.

The funding challenge faced by food systems can only be effectively addressed through an inclusive transformation that prioritizes the needs of LDCs and commercially oriented SMEs (smallholder farmers and other food systems' SMEs). These groups face disproportionately greater challenges, such as limited access to affordable capital and financing mechanisms, heightened levels of poverty and increased food insecurity, among other obstacles, making it crucial for all actors to pay closer attention to their needs.

G20 members should collaborate with development financial institutions as they initiate the process of reforming their operations, governance, risk tolerance, and fund alignment toward climate change mitigation and adaptation. Implementing a specific food systems mandate for development financial institutions will significantly contribute to accelerating the transition in least developed countries worldwide.

This can be achieved by expanding risk-reduction instruments, co-investing with the private sector, setting clear targets for private capital mobilization, and improving project preparation support. Additionally, creating a public database of development financial institutions' projects and risk mitigation tools, along with making existing market data resources readily available, will further enhance transparency and attract private investors.

Intermediaries in the food value chain and local financial institutions possess the potential to benefit a greater number of people, particularly in areas where small-scale agriculture is prevalent and climate finance is notably lacking, such as Sub-Saharan Africa and South Asia. G20 members should tap into this potential to guarantee that all farmers have access to affordable financing.

Support local financial institutions, with the support of development financial institutions, to develop specific capabilities and financial products to provide and coordinate affordable and fit-for-purpose commercial financing to farmers.

To fully harness the advantages of regenerative agriculture, financial institutions must cultivate and enhance new capabilities. They will need to establish data resources, teams, and models to integrate information about farmers' adoption of regenerative practices into decisions regarding new product design, loan and insurance eligibility, and terms. By doing so, they can create a competitive advantage and mainstream agrifood climate financing.

Financial institutions can also support regenerative agriculture adoption by aggregating and coordinating investment from a range of public and private capital providers, pooling risk across farmers, intermediating the remuneration of ecosystem services, and creating the financial mechanisms required to pay farmers in advance for the expected value of these services.

In geographies where the agricultural financial landscape is more fragmented, leadership and support from governments and development financial institutions will be essential in bringing smaller lenders and insurers to the table and providing policy changes or public investment that may be needed to support greater innovation in financial offerings.



Policy Action 2.2

Monetize the value of relevant ecosystem services delivered by regenerative and sustainable agriculture practices, including improved resilience and environmental outcomes. G20 members should develop a regulatory framework to accelerate the development of high-integrity, interoperable credits for ecosystem services (e.g., carbon sequestration, healthy soils, freshwater use and pollution reduction, biodiversity conservation, etc.).

Executive Summary

This recommendation focuses on monetizing ecosystem services. **To achieve this goal, G20 members should:**

- a. Promote private investment in agrifood systems by evolving and simplifying regulation, enhancing transparency, creating internationally harmonized taxonomies for sustainable activities and promoting the remuneration of ecosystem services.
- b. Collaborate to create standardized accounting methodologies, ensuring verifiable credibility of high integrity and interoperable credits for ecosystem services.
- c. Kick off or expand existing ecosystem services monetization programs with self-sustaining potential to comprehensively coordinate all required elements, including the provision of technical and financial services stack, monetization and capture of the full value of relevant ecosystem services, aggregation of catalytic and long-term capital, and mobilization of all required stakeholders.

Background and Context

As previously mentioned, ecosystem services *"are the direct and indirect benefits that ecosystems provide humans. Agroecosystems, rangelands, and forests provide suites of ecosystem services that support and sustain human livelihoods. [...]. When managed well, these systems can be both providers and beneficiaries of a number of additional ecosystem services, including pest control, pollination, flood protection, improved soil health, and water filtration."*

The compensation of these services, by channeling resources to farmers who adopt technologies and practices that integrate regenerative systems, helps address the important economic barriers. In a few words, by increasing farmers' profitability, compensation for environmental services can provide more resources to be reinvested in modern inputs and equipment while it generates additional cash flows that also reduces payback periods with upfront payments. With an additional revenue stream, long-term risks and uncertainties can also be drastically mitigated.

The main challenge to unlock these value streams is the incipient nascent market regulation. Virtually, few ecosystem services have a global market where ecosystem services generate high-integrity and interoperable credits. Progressing in this agenda is essential to transform food systems and therefore combat climate change while strengthening food security and fighting hunger.



Promote private investment in agrifood systems by evolving and simplifying regulation, enhancing transparency, creating internationally harmonized taxonomies for sustainable activities and promoting the remuneration of ecosystem services.

As stated in Policy Action 2.1., policymakers should encourage more private capital to flow into agrifood systems by addressing potential unintentional barriers to impact investments and ensuring that the financial regulatory environment supports and catalyzes the development and use of new financial products and partnerships. For instance, they can simplify application and qualification processes for farmers to access existing funding opportunities.

Through enhanced standards, transparency, and data collection regarding impact investments in agrifood systems, policymakers may also stimulate private actors to prioritize the sector in their impact investment commitments and strategies, in a joint effort to finance a new agriculture paradigm. It is significantly important to harmonize taxonomies among countries to support the development of a sustainable agricultural food system. International agriculture standards such as AFi, Climate Bonds, and SBTi can provide valuable sectoral references and pathways. In building this harmonized taxonomy, G20 countries should aim for:

- a. Objective: The taxonomy should focus on the environment, aligned with the Paris Agreement, but also include best practice social safeguards. Respondents must also prove that activities do not cause harm to other goals.
- b. Scope: The taxonomy should cover a broad spectrum of activities, but not include transitional activities in the classification of green investments.
- c. Detail: To balance breadth and specificity, the taxonomy should not be based on principles or projects, but rather on activities, ideally classified according to the International Standard Industrial Classification of All Economic Activities. Instead of binary classifications, the scaling of activities at different levels of sustainability should be used.

Governments should promote the remuneration of ecosystem services, such as carbon mitigation and sequestration, which can provide farmers with an additional revenue stream. The resulting increase in profitability and reduction of investment risks in the agricultural sector may incentivize larger private capital flows into the sector.

Collaborate to create standardized accounting methodologies, ensuring verifiable credibility of high integrity and interoperable credits for ecosystem services.

Effectively remunerating these services requires robust measurement, reporting, and verification (MRV) protocols. Several initiatives have emerged, specifically in the realm of carbon market development; however, the advancement of these metrics and protocols remains a substantial area for further progress both for carbon and for other ecosystem services markets. Moreover, to enhance the quality of the developed KPIs, G20 members should develop an ongoing work program to share knowledge on payment for ecosystem models being used, including analysis of rates and duration of participation and environmental outcomes. This can support the development of robust common metrics that can promote interoperability between different payments for ecosystem schemes.

G20 members can play a pivotal role in establishing a framework for this remuneration. A crucial first step is developing standardized accounting methodologies. This means creating a unified approach for quantifying and reporting the relevant ecosystem services provided by regenerative farms. G20 members should collaborate on establishing common accounting frameworks or endorsing existing ones.

Secondly, ensuring verifiable credibility is paramount for fostering trust in these markets, highlighting the importance of independent verification. To ensure the high integrity of carbon and other ecosystem service credits, we need to strengthen existing common protocols or create new ones. These protocols must guarantee that credits represent measurable environmental benefits that go beyond what would be achieved through “business as usual” practices.



The global nature of sustainability challenges, particularly climate change, necessitates a borderless approach, which means G20 members should champion interoperable MRV protocols. This entails ensuring that the MRV systems for ecosystem services function and trade seamlessly across sectors and international borders. This will ultimately maximize the impact of regenerative agriculture practices on a global scale, ensuring sustainable comparative advantages among different sectors and countries are optimally leveraged.

The establishment of standard metrics and international markets, however, does not mean that ecosystem services should be measured the same way around the globe. The interaction of different production practices with ecosystems can be drastically different between tropical and temperate climates, for example. In a recent assessment, for instance, Embrapa – Brazilian Agricultural Research Corporation – developed a specific calculator for soybeans produced in the Cerrado and Amazon regions, which, based on a life cycle assessment, estimated an emission intensity up to two-thirds lower than the estimated values available in internationally recognized databases. When establishing these internationally standardized and science-based metrics, G20 members should consider these specificities in order to maximize the accuracy of the measurements, rewarding farmers in the most accurate way.

Box 6 – Early stages of carbon market standards⁸²

Developed by researchers at Agriculture and Agri-Food Canada (AAFC), the Holos model is a software application designed to estimate greenhouse gas (GHG) emissions and soil carbon (C) changes within Canadian agricultural systems. Upholding principles of transparency and reliability, the model functions as a whole-farm assessment tool. To ensure transparency, the algorithm documentation and the ability to override default settings are readily available online, further supported by the model's open-source development framework. Reliability is demonstrably achieved through the model's foundation in peer-reviewed scientific literature and its close alignment with the Canadian National Inventory Report.

In New Zealand, although agricultural emissions are not part of the New Zealand Emissions Trading Scheme, the nation plans to become the first to introduce pricing for them by 2025. Agricultural sector leaders and the industry have collaborated in a partnership to develop a pricing system that maintains the international competitiveness of agricultural products while simultaneously lowering emissions. One of the major challenges lies in balancing the need for accuracy with the practicality of implementation, while also considering the compliance cost for farmers.

In both cases, there is a tension between creating a simple model that is practical and accessible enough for farmers, but also a model that is robust and accurate enough to represent the real impact of their actions on the farm. International frameworks and standards will also face the challenge of balancing this tradeoff.

Kick off or expand existing ecosystem services monetization programs with self-sustaining potential to comprehensively coordinate all required elements, including the provision of technical and financial services stack, monetization and capture of the full value of relevant ecosystem services, aggregation of catalytic and long-term capital, and mobilization of all required stakeholders.

Besides establishing the foundation for the ecosystem services compensation market, coordinating various stakeholders will be necessary to ensure widespread penetration among farmers and the diverse buyers of these services. Exhibit 5, from the WEF and Bain report⁸³, illustrates a breakthrough model for financing and collaboration that coordinates actors in and beyond the agri-food value chain to deliver the farmer stack and fully monetize ecosystem services.

Farmers should have access to multiple service providers, both financial and non-financial, to address barriers to the adoption of technologies and sustainable and resilient practices. Financial support should include upfront payments to defray economic risks, while non-financial support should

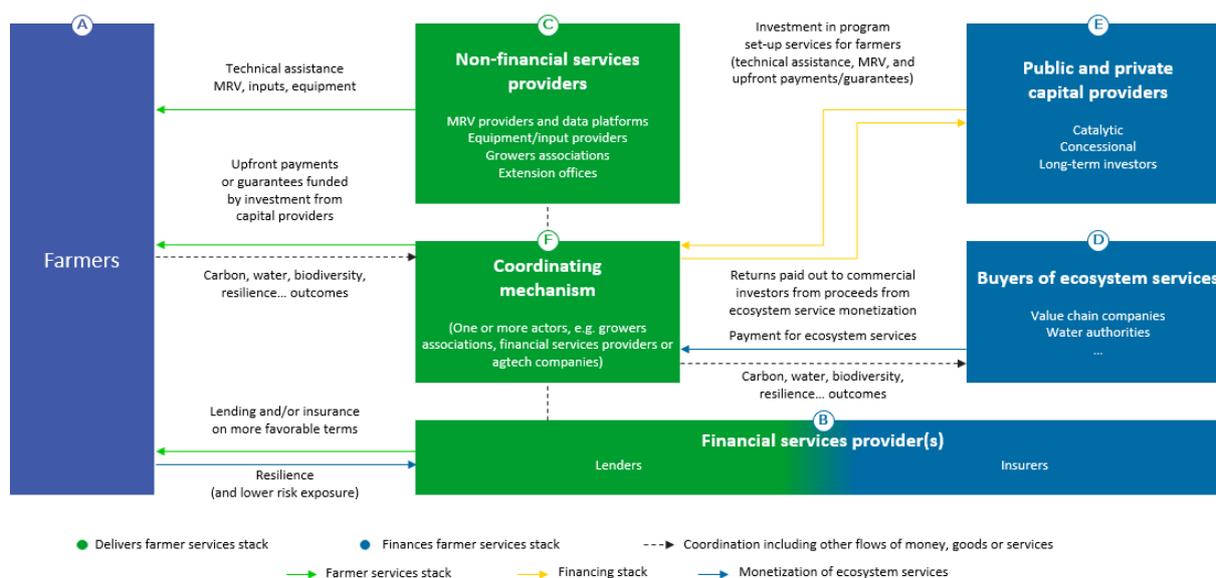
⁸² OECD. *Report of the 32nd Meeting of the OECD's Farm-Level Analysis Network*. 2023.

⁸³ WORLD ECONOMIC FORUM, BAIN & COMPANY. *100 Million Farmers: Breakthrough Models for Financing a Sustainability Transition*. 2024.



include technical assistance and MRV services. Moreover, it is imperative for ecosystem services to be quantified, consolidated, and sold to a diverse range of buyers in order to capture their complete value. The creation and consolidation of ecosystem services markets also required capital from multiple sources (public and private philanthropic funds, impact investors, banks, and others) with different return expectations and horizons. These investments are critical to finance the initial program set-up and pay for the support farmers receive, especially before ecosystem services are fully monetized.

Exhibit 5 – Illustration of a breakthrough model for financing and collaboration



Source: 100 Million Farmers – Breakthrough models for financing a sustainability transition⁸⁴

Most existing programs do not include all the essential elements of breakthrough models for financing and collaboration. These gaps often manifest in several ways, such as failing to offer comprehensive financial or technical services, struggling to monetize or capture the full value of relevant ecosystem services delivered by regenerative and sustainable agriculture practices, being unable to engage all relevant stakeholders or tap into diverse sources of capital, among others. These limitations highlight the need for innovative and collaborative approaches that address these shortcomings and create more comprehensive, effective, and inclusive programs for sustainable and resilient development.

To establish coordination mechanisms that facilitate these activities, governments can create new specialized entities for this specific purpose, especially in less developed countries and in regions with a highly fragmented agricultural sector and lower levels of coordination. In many cases, however, G20 members can leverage existing initiatives led by various actors, such as growers’ associations, financial institutions, and/or agricultural technology companies. To enable these initiatives to operate at their full potential and incorporate all the necessary elements to constitute innovative financing models, countries should ensure:

- Initiatives aggregate and manage the public and private catalytic, concessional, and long-term investment required to adequately support farmers in the early years of their transitions and ensure the change is long-lasting.
- Farmers are provided with necessary technical services, such as agronomic technical assistance and MRV capabilities, to credibly quantify and verify the outcomes.

84 WORLD ECONOMIC FORUM, BAIN & COMPANY. 100 Million Farmers: Breakthrough Models for Financing a Sustainability Transition. 2024.



- c. Financial institutions develop required capabilities and fit for purpose financial services, including lending and insurance on more favorable terms and adequate upfront payments or guarantees.
- d. The full value of the different ecosystem services delivered by regenerative agriculture is valued and monetized, coordinating payments for those ecosystem services from the full set of actors that will benefit from it. Even though other benefits beyond carbon capture are not yet broadly measured and traded, buyers often are willing to pay a price premium for them.

Box 7 – Existing initiatives examples⁸⁵

The Soil and Water Outcomes Fund (SWOF) is a US program managed by AgOutcomes that supports farmers implementing regenerative practices like no-till farming, cover crops, and extended crop rotations. SWOF offers a unique financing model, with farmers receiving 50% of estimated payments upon enrollment and the remaining 50% after outcomes are measured and verified. In its first two years, SWOF provided average payments of over \$30 per acre to enrolled farmers for verified climate and water outcomes. The program monetizes multiple ecosystem services, establishing a market for environmental outcomes by selling them to various corporate buyers and local authorities. Funded by private and public sources, including the USDA, SWOF started in 2020 with nearly 10,000 acres in Iowa and was expected to cover 250,000 acres across 19 states by 2023. Over 90% of participating farmers in 2022 were likely to recommend the program to others.

In line with its commitment to carbon neutrality by 2050, Crédit Agricole, in collaboration with France Carbon Agri, plans to launch a voluntary carbon credit market platform in 2024. The platform will connect companies and local authorities seeking to offset their carbon footprint with 2,000 sustainable agriculture projects that reduce emissions and enhance greenhouse gas capture through practices certified by France Carbon Agri's methodology.

⁸⁵ WORLD ECONOMIC FORUM, BAIN & COMPANY. **100 Million Farmers**: Breakthrough Models for Financing a Sustainability Transition. 2024.



RECOMMENDATION 3

Recommendation 3



Recommendation is aligned with previous B20 editions

Strengthen the rules-based, non-discriminatory, inclusive, and equitable multilateral agricultural trading system, with the WTO at its core, to foster the adoption of sustainable practices and improve food security.

Policy Actions

Policy Action 3.1: Advance the WTO’s rules-based multilateral agricultural trading system, eliminating market distorting barriers, while orchestrating sustainable practices adoption over time and guaranteeing food security. G20 members should foster global convergence on science and outcome-based sustainable food trade regulatory practices, methodologies, and taxonomies, anchored on the international trading system with WTO, and its international standard setting bodies, at its core.

Policy Action 3.2: Support actionable, science- and rules-based measures to enable sustainable practices adoption while facilitating market access within the advancements of the WTO’s rules-based multilateral agricultural trading system. G20 members should foster the adoption of sustainable practices and facilitate market access by improving the efficiency of international standard-setting bodies and ensuring transparency through traceability and certification schemes.

Key Priority Indicators	Baseline	Target	Classification
G20 Imports Impacted by Restrictive⁸⁶ Measures <i>Source: World Trade Organization</i>	11.8% (2023)	Eliminate restrictions that do not comply with WTO’s science- and rules-based system ⁸⁷	 New indicator
Prevalence of moderate or severe food insecurity (percentage of population) – World / LDCs⁸⁸ <i>Source: FAO</i>	29.5 / 59.3 (2021)	0% / 0% (2030)	 New indicator
Emission intensity of food products^{6, 89} (CO₂eq / kg) - World <i>Source: FAO</i>	Based on product type	43% reduction based on product type	 New indicator
Developing countries’ and LDCs’ share of global exports (percentage of global exports) – Developing Countries / LDCs <i>Source: UNCTAD and WTO</i>	43.2% / 1.1% (2022)	50% / 2% (2030)	 New indicator

⁸⁶ Import restrictions Account for both Tariff and non-tariff barriers.

⁸⁷ G20 countries should roll-back on unjustified, non-science-based barriers that are not compliant with WTO guidelines for agrifood trade. Recognizing the indicator’s limitations regarding food safety and evolving sustainability rules, a numerical target will not be set for it at this moment. Instead, we recommend close monitoring of the indicator, specifically for the agrifood commodities, to assess progress aligned with WTO guidelines.

⁸⁸ Both KPIs were already mentioned in Recommendation 1, as both recommendations are interconnected in the purpose of fostering sustainable practices and hindering global hunger.

⁸⁹ The GHG emissions used in the computation of the FAOSTAT Emissions Intensities indicator correspond to those generated within the farm gate. Additional emissions from upstream and downstream production and consumption processes and trade are excluded due to the lack of granular information needed for this analysis.



Aspirational KPIs: The task force also acknowledges the relevance of three additional indicators to Recommendation 3, but, due to limited data collection, they were not included in the proposed KPIs list.

- a. **(New Indicator) Food Balance Index:** We propose developing a new composite indicator, a “food balance index,” to assess a country’s food security situation in the context of international trade. This index would incorporate measures of self-production, import reliance, and the significance of agricultural exports to the economy. By capturing these interacting factors, the food balance index can provide a more balanced and nuanced picture of a country’s trade policy space for food security.
- b. **(Existing Indicator, with limited data) Sustainable Forest Management:** We recommend the use of the Sustainable Forest Management Indicator to monitor the progress toward sustainable management of all types of forests, halting deforestation and restoring forests. This aspirational indicator contains five sub-indicators:
 - i. Forest area net change rate (percentage): Measures the overall change in forest area over time (expansion or loss).
 - ii. Above-ground biomass stock in the forest (t C/ha): Tracks the amount of living organic matter stored in trees within the forest area.
 - iii. Proportion of forest area located within legally established protected areas (percentage): Monitors the extent of forest area under legal protection for conservation purposes.
 - iv. Proportion of forest area under a long-term forest management plan (percentage): Assesses the presence of documented plans for managing forest resources sustainably over an extended period.
 - v. Forest area under an independently verified forest management certification scheme (percentage): Tracks the proportion of forest area that has undergone independent verification against established sustainability standards.
- c. **(New Indicator) Agricultural commodity (by value) traded internationally with verifiable traceability systems in place (percentage):** This indicator measures the proportion of a specific agricultural commodity (e.g., cattle, palm oil, soy) traded internationally that can be tracked throughout the supply chain from farm to consumer. A higher percentage indicates a greater level of transparency within the supply chain for that specific commodity, allowing for better monitoring of environmental and social impacts.

SDGs

Recommendation 3 Contributes to the achievement of the following UN SDGs:



Recommendation 3 contributes to SDG 2 – **End hunger, achieve food security and improved nutrition, and promote sustainable agriculture** – particularly SDG 2.1 “Ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round” by 2030.¹ Since food insecurity is a measure of access to food, this means ending moderate and severe food insecurity for all,” SDG 2.4 “By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.”



Recommendation 3 contributes to SDG 13 – **Take urgent action to combat climate change and its impacts** – particularly SDG 13.1 “Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.” SDG 13.2 “Integrate climate change measures into national policies, strategies and planning,” and SDG 13.b “Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.”

Recommendation 3 contributes to SDG 15 - **Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss** – particularly SDG 15.2 “promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.”

Recommendation 3 contributes to SDG 17 – **Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development** – particularly SDG 17.10 “Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization,” SDG 17.11 “Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries’ share of global exports,” and SDG 17.12 “Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries.”

While Recommendation 3 primarily focuses on SDGs 2, 13, 15, and 17, it also has the potential to contribute to broader sustainable development goals. These include SDG 1 **End poverty in all its forms everywhere**, SDG 6 **Ensure availability and sustainable management of water and sanitation for all**, SDG 9 **Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**, SDG 12 **Ensure sustainable consumption and production patterns**.

Relevant B20 Brasil Guiding Claims

Recommendation 3 has strongest impact on three B20 Brasil Guiding Claims:



Promote inclusive growth and combat hunger, poverty and inequality



Accelerate a fair net-zero transition



Foster the resilience of Global Value Chains

Recommendation 3 also presents relevant impact on the other two Guiding Claims. Mobilizing International Cooperation and Trade to foster Sustainable Practices and promote Food Security will also “Increase Productivity through innovation” and “Enhance human capital.” The strongest and most direct correlations, though, are to the three axes highlighted in this section.



Relevant G20 Brasil Priorities

Recommendation 3 contributes to the following priorities of the G20 Brasil:

Four of G20 Brasil's Agriculture Working Group key priorities.

- a. Sustainability of agrifood systems in their multiple paths.
- b. Enhancing international trade contribution to food and nutritional security.
- c. Recognizing the essential role of family farmers, peasants, indigenous people, and traditional communities in sustainable, healthy, and inclusive food systems.
- d. The focus of the two policy actions aligns well with both priorities. The first policy action focuses on mobilizing the WTO's international trade system to foster sustainable practices and food production, while the second is more concerned with enabling compliance and measurement to the progress of this sustainable trade journey.

Both the Global Alliance Against Hunger and Poverty Task Force's missions:

- a. Provide sustained, political drive at the highest level by the Group of 20 and other Global Alliance Members, galvanizing collective action over other existing efforts to eliminate poverty and hunger across the world.
- b. Promote and facilitate mobilization and better alignment of international support, including financial resources and knowledge, to enable large-scale, country-level implementation of policy instruments and programs that were already proven effective to advance these goals, especially in the countries most affected by hunger and high poverty levels.
- c. Recommendation 3, primarily through its first policy action, plays a clear role in combating poverty and hunger worldwide, utilizing international trade and cooperation as its tools.

Context

As mentioned in this paper's introduction, building on international cooperation and trade offers a valuable means to enhance global food security, manage the challenges of balancing economic growth with environmental sustainability, and bolster the resilience of the global agri-food system in the face of disruptions like conflicts, pandemics, and extreme weather events. This collaborative approach can ensure the continued availability of affordable and nutritious food for all while simultaneously supporting the transition toward a lower-carbon food system with a minimized environmental footprint⁹⁰.

Trade has become increasingly vital for global food security. Population growth and rising per capita food demand have outstripped production in some regions, underscoring the importance of trade in linking areas with surpluses to those experiencing food shortages. Trade has become key to guaranteeing food security, as some countries do not have enough natural resources to be self-sufficient in food production. This reliance on trade is likely to persist and potentially even worsen, especially due to the rise in climatic events, which presents a growing threat to agricultural production, making it increasingly challenging for countries to rely solely on domestic production for food security⁹¹. In this evolving landscape, trade also emerges as a critical tool to ensure not only the quantity of food supplies for populations but also the nutritional quality⁹². By facilitating access to diverse food sources from around the world, trade can help mitigate the impact of climate-related disruptions on specific regions and ensure populations have access to the essential nutrients they need for a healthy life.

⁹⁰ FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. *The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development*. 2022.

⁹¹ OECD; FAO. *OECD-FAO Agricultural Outlook 2022-2031*. 2022

⁹² OECD; FAO. *OECD-FAO Agricultural Outlook 2022-2031*. 2022



Today, the significance of global food trade cannot be overstated. Over the past two decades, the global agricultural trade landscape has undergone a significant expansion. The monetary value of global agricultural exports has quadrupled in nominal value from 2000 to 2022, surging from \$406 billion to a staggering \$1.6 trillion⁹³. A substantial share of international commerce involves agricultural products, accounting for nearly one-fifth of all commodities traded globally⁹⁴. Fertilizers, essential for agricultural production, add another estimated 2 percent to this total⁹⁵, highlighting the interconnectedness of food production and international trade.

The landscape of the global food trade has undergone a significant transformation over the past three decades. In 1995, a small number of countries dominated the global food trade market. However, with the rise of globalization and trade liberalization efforts like the World Trade Organization's (WTO) Doha Round, the number of major players has increased. This shift reflects the reduction of trade barriers negotiated through agreements like the Doha Round, making it easier for new countries to participate in the global food trade^{96 97}.

While globalization initially fostered increased interconnectedness, the 2008 financial crisis led to a slowdown. This, coupled with concerns about food security, spurred a trend towards regionalization – the trade in countries within the same region rather than between regions. The reasons for this shift in dynamics are numerous: lower food import prices due to lower distances, similar cultures and consumer preferences, more integrated infrastructure, and closer collaboration with neighboring countries^{98 99}. Environmental and economic concerns have also contributed to this trend, as some consumers prefer buying locally to limit transportation emissions and support local economies. Awareness about the environmental impact of importing foods from countries at risk of deforestation is growing as well. Today, the data reflects this shift towards regional trade. Trade intensity, a measure of how much trade occurs between two regions relative to their overall trade volume, is demonstrably higher within regions than across them. Statistics show that half of all Regional Trade Agreements (RTAs) involve countries in the same region, with most of the remaining agreements connecting countries in two different regions. Notably, only 1 percent of RTAs involve two or more distant regions¹⁰⁰.

Furthermore, when examining the top 10 global food trade flows, seven occur within the same region, highlighting the prevailing trend toward regionalized trade¹⁰¹. In this evolving trade landscape, countries with high international inter-regional trade volumes, such as Brazil, China, the United States, and Japan, play a critical role. These nations have the potential to foster global food system transformation through responsible trade practices. By promoting open, fair, and sustainable trade policies, these countries can contribute to a more resilient and equitable global food system that benefits all regions.

93 CHATHAM HOUSE. **Chatham House Resource Trade Database**: resource Trade: Earth. Available at: <https://resourcetrade.earth/>.

94 CHATHAM HOUSE. **Chatham House Resource Trade Database**: resource Trade: Earth. Available at: <https://resourcetrade.earth/>.

95 CHATHAM HOUSE. **Chatham House Resource Trade Database**: resource Trade: Earth. Available at: <https://resourcetrade.earth/>.

96 OECD; FAO. **OECD-FAO Agricultural Outlook 2022-2031**. 2022

97 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022**: The geography of food and agricultural trade: Policy approaches for sustainable development. 2022.

98 OECD; FAO. **OECD-FAO Agricultural Outlook 2022-2031**. 2022

99 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022**: The geography of food and agricultural trade: Policy approaches for sustainable development. 2022.

100 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022**: The geography of food and agricultural trade: Policy approaches for sustainable development. 2022.

101 HUMMELS, D.; SCHAUR, G. Time as a Trade Barrier. **American Economic Review**, v. 103, n. 7, p. 2935-2959, 2013. Available at: <https://doi.org/10.1257/aer.103.7.2935>.



Exhibit 6 – Largest Food (excluding fish) trade flows between countries

Exports from	To	Value
Brazil	China, mainland	USD 46.7 billion
Mexico	United States of America	USD 39.1 billion
Canada	United States of America	USD 38.4 billion
United States of America	China, mainland	USD 37.8 billion
Netherlands (Kingdom of the)	Germany	USD 30.2 billion
United States of America	Canada	USD 29.8 billion
United States of America	Mexico	USD 27.9 billion
United States of America	Japan	USD 14.2 billion
Germany	Netherlands (Kingdom of the)	USD 13.9 billion
Netherlands (Kingdom of the)	Belgium	USD 13.9 billion

Source: FAO 2023. Detailed trade matrix

The global food trade landscape is characterized by distinct regional patterns. Currently, the Americas hold the position of the largest net food exporter, while Asia is the leading net food importer. Europe transitioned to becoming a net food exporter in 2013, and Oceania recently regained its position as the second-largest net food exporter, surpassing Europe in 2022. This regional specialization highlights the interconnectedness of the global food system, where some regions excel in food production while others rely on imports to meet their needs¹⁰².

Despite the fragmented nature of the agricultural commodity market, a small number of key commodities play a significant role. The top five agricultural commodities (soy, wheat, beef, maize, and palm Oil) account for approximately 28 percent of the entire internationally traded agricultural commodity market in value¹⁰³. Identifying and understanding the trade dynamics of these key commodities and their impact on climate and natural resources is crucial for ensuring food security and fostering a more resilient global food system.

Exhibit 7 – Top 5 most traded Agricultural commodities globally (in value)

Commodity	Value (\$ Bn, 22)	Agr. Commodities Share (%22)	5 Y Increase (% , 17-22)
Soy	159	10%	10%
Wheat	84	5%	9%
Beef	74	5%	9%
Maize	73	4%	15%
Palm	66	4%	11%
Top 5 Agr. Commodities	456	28%	
Total Agr. Commodity	1.633	100%	

Source: Chatham House¹⁰⁴

¹⁰² OECD; FAO. [OECD-FAO Agricultural Outlook 2022-2031](#). 2022

¹⁰³ CHATHAM HOUSE. [Chatham House Resource Trade Database](#): resource Trade: Earth. Available at: <https://resourcetrade.earth/>.

¹⁰⁴ WTO. Available at: https://www.wto.org/english/news_e/news20_e/ddgaw_30apr20_e.htm



Drivers of Food Trade

The global food trade landscape is shaped by a dynamic interplay between comparative advantage and trade costs¹⁰⁵. Countries with a natural resource endowment, climate, or skilled workforce that allows them to produce specific agricultural goods at a relatively lower cost hold a comparative advantage in those products. This advantage incentivizes specialization, as nations focus on producing what they do best and then trade for goods they can import more efficiently¹⁰⁶. By facilitating trade that leverages comparative advantages and minimizes trade costs, it is possible to work toward a more efficient and equitable global food system where all regions benefit from a diverse and stable supply of food.

Box 8 – Key Drivers Definition^{107,108}

Comparative Advantage: A country has a comparative advantage in a product if it can produce it using fewer resources (like labor, land, or capital) compared to its trading partners. This advantage can stem from factors like superior technology, abundant natural resources, or a skilled workforce specific to that good or service. In the context of agriculture, comparative advantage is heavily influenced by the differences in resource endowments across countries. For instance, a country with vast fertile land and abundant freshwater might have a comparative advantage in producing land and water-intensive commodities such as wheat compared to a country with limited resources. Additionally, it's important to note that currently those comparative advantages do not consider the value of ecosystem services that natural resources from each land can encompass. The valuation of those services can increase even more the comparative advantage of some nations.

Trade Costs: Trade costs are the additional expenses incurred beyond the production cost of a good or service when it is traded internationally. These costs can significantly impact trade flows and weaken the influence of comparative advantage.

- a. **Transport Costs:** These are the expenses associated with physically moving goods from the producer to the consumer across borders. The text highlights that transport costs, particularly for maritime shipping which dominates grain trade, increase with distance. This incentivizes countries to trade with geographically closer partners.
- b. **Policy Costs:** Government policies like tariffs (taxes on imports) and non-tariff measures (NTMs) like quotas or lengthy customs procedures can inflate trade costs. While tariffs have seen a significant reduction globally since the 1990s, NTMs remain prevalent in agriculture, especially for low- and middle-income countries. These costs create a wedge between the price a producer receives and the price a consumer pays, ultimately hindering trade flows.

Trade barriers and disruptions, including logistical complexities and national trade policies, can hinder the realization of comparative advantage and contribute to food insecurity, particularly in developing countries with lower agricultural productivity and limited access to technologies. These barriers can significantly impede efficient market access for some food products, especially in the short term and in countries where food represents a high share of the total per capita expenditure, hindering the smooth functioning of the global food system.

- a. Transportation costs, a significant barrier, typically increase with distance. Studies indicate a 10 percent rise in distance between two ports can lead to a 2.5 percent increase in freight rates for vital commodities like grains and oilseeds¹⁰⁹. Border inefficiencies, particularly for perishable goods, further exacerbate these costs. Estimates suggest that a one-day border delay for food and beverages translates to a 3.1 percent increase in trade costs compared to 2 percent for other goods¹¹⁰.

105 OECD; FAO. OECD-FAO Agricultural Outlook 2022-2031. 2022

106 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.

107 OECD; FAO. OECD-FAO Agricultural Outlook 2022-2031. 2022

108 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.

109 ITC - INTERNATIONAL TRADE CENTRE. The Invisible Barriers to Trade: how Businesses Experience Non-Tariff Measures. **Technical Paper**, v. xii, MAR-15-326.E, p. 39. Available at: <https://intracen.org/resources/publications/the-invisible-barriers-to-trade>.

110 HUMMELS, D.; SCHAUR, G. Time as a Trade Barrier. **American Economic Review**, v. 103, n. 7, p. 2935-2959, 2013. Available at: <https://doi.org/10.1257/aer.103.7.2935>.



- b. National Trade Policies also have a large impact on trade flows. While some policies aim to protect domestic producers or ensure food safety, they can create unintended consequences. For instance, tariffs (taxes) or quotas (limits) on imports can inflate the cost of food for consumers and limit their access to a wider variety of products. Similarly, overly stringent sanitary and phytosanitary (SPS) measures not aligned with the Codex Alimentarius can create trade barriers and limit market access by increasing compliance costs^{111,112}.

While trade barriers can hinder efficient food trade, unforeseen external events can also significantly disrupt established trade agreements and global food supply chains¹¹³.

- a. Geopolitical Events: Wars can have a devastating impact on food security. They can disrupt agricultural production, damage transportation infrastructure, and lead to trade route closures. This can cause significant food shortages and price spikes in affected regions and beyond. Moreover, political instability can create uncertainty for businesses involved in the global food trade. This can discourage investment and hinder long-term planning, ultimately impacting trade flows.
- b. Natural Disasters: Natural disasters can have a direct impact on agricultural production. Floods and droughts can damage crops and livestock, leading to food shortages. Disasters can also disrupt transportation infrastructure, making it difficult to move food from areas of surplus to those facing shortages.
- c. Pandemics: The recent COVID-19 pandemic serves as a stark example of how pandemics can disrupt global food supply chains. Labor market disruptions, transportation restrictions, and border closures all contributed to significant challenges in moving food products across borders.

Open food trade, while stimulating economic activity and consumer choice, necessitates acknowledging the impact on various farm sizes. Small-scale farmers in developing nations are crucial for ensuring local food security and dietary diversity. However, they often face difficulties competing with large international producers in commodity markets. Thus, in addition to addressing trade barriers and disruptions, a critical component of a secure and sustainable global food system lies in strengthening national food systems. Developing countries, particularly vulnerable to trade disruptions, require robust domestic agricultural sectors to ensure food security. National food policies that prioritize a resilient domestic agricultural sector can play a key role in this regard. Supporting family farming through targeted investments in infrastructure, technology, and education for farmers is a crucial element of this strategy, as mentioned in Recommendation 1 of this policy paper. Empowering family farmers fosters sustainable practices that increase local food production, diversify food sources, and ensure a more equitable distribution of food resources within a country. Ultimately, a two-pronged approach that tackles trade barriers and disruptions while simultaneously strengthening national food systems is the path toward a more secure and sustainable global food system^{114 115 116}.

Trade plays a critical role in global food security by ensuring access to affordable and stable food supplies. It allows countries to import during shortages and specialize in producing food based on their natural resources. Additionally, global food trade is key to allocating resources efficiently and balancing the trade-offs between economic and environmental needs¹¹⁷. In the following sections, we will address the complexities and challenges of trade in ensuring food security for all without harming the planet.

111 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. [The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development](#). 2022.

112 CROPLIFE. [Croplife international recommendations to 13th wto ministerial conference negotiators](#). 2023.

113 OECD; FAO. [OECD-FAO Agricultural Outlook 2022-2031](#). 2022.

114 OECD; FAO. [OECD-FAO Agricultural Outlook 2022-2031](#). 2022.

115 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. [The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development](#). 2022.

116 CLAPP, J. [The State of Agricultural Commodity Markets 2015-16 Background paper: Unpacking disputed narratives](#). [FAO Food security and international trade](#), dec. 2015

117 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. [The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development](#). 2022.



Trade: A Cornerstone of Global Food Security

As highlighted earlier, food trade plays a critical role in combating hunger and ensuring global food security, promoting a positive impact on the four key pillars of food security: availability, accessibility, utilization, and stability.

Availability refers to the physical existence of sufficient food to feed the world's population. This includes factors like agricultural production, food imports and exports, and stock levels. Trade is particularly relevant in this pillar for several reasons. Firstly, a significant portion of the global population relies on international trade to meet their basic food needs. Estimates suggest that 1 in 6 people depend almost entirely on imports to be fed¹¹⁸. Moreover, some regions lack the capacity to produce enough food to sustain their populations and rely on imports to guarantee availability. This is particularly true in more than 30 countries, especially in Africa and the Middle East, where trade is essential not only for variety but also for basic food sufficiency¹¹⁹. (60) Finally, population growth and production disruptions caused by climate change events or pandemics like COVID-19 can further strain food availability. Trade acts as a safety net, allowing countries to import food during shortages^{120 121}.

Accessibility focuses on people's ability to acquire sufficient, nutritious food, considering factors like income levels, food prices, and distribution networks. Trade can support food accessibility through lower food prices for consumers through comparative advantage principles and through product specialization, as countries can specialize in producing the food they can grow most efficiently, and then trade for other food products, ultimately increasing overall affordability. Studies by FAO suggest that removing trade barriers and associated costs could reduce global food prices by approximately 15 percent, significantly improving food accessibility for low-income populations¹²².

Utilization emphasizes the proper use of food by individuals and households. This involves factors like knowledge of nutrition, food safety practices, and the ability to prepare and consume food effectively. Trade can bring access to a wider variety of foods rich in essential nutrients. This is particularly beneficial for populations that might otherwise have limited dietary options due to local production constraints¹²³.

Stability highlights the need for a consistent food supply over time, considering factors like climate variability, economic shocks, and political instability that can disrupt food availability and access. Trade acts as a buffer for food stability by allowing countries to import food to meet their populations' needs during shortages and disruptions. This helps smooth out seasonal variations in production and compensate for disruptions caused by unforeseen events. Trade also facilitates a global food balance, ensuring a more consistent and reliable food supply across the globe¹²⁴.

Open Food trade, while fostering economic growth and consumer access, requires careful consideration of different production scales. Smallholder farmers in developing countries play a vital role in local food security and a balanced diet. However, they often struggle to compete with large-scale international producers in commodity markets. To bridge this gap, the food trade of specific large-scale commodities should be complemented with national policies that promote target investments in strengthening local agriculture through infrastructure, technology, and education, as proposed in Recommendation 1 of this paper. Empowering smallholder farmers through this development will strengthen their critical role in providing fresh, nutritious food for local populations while also guaranteeing production resilience and stable income. By acknowledging the delicate and intricate relationship between open food trade and the strengthening of internal markets and taking deliberate

118 WTO. Available at: https://www.wto.org/english/news_e/news20_e/ddgaw_30apr20_e.htm

119 WTO. Available at: https://www.wto.org/english/news_e/news20_e/ddgaw_30apr20_e.htm

120 OECD; FAO. **OECD-FAO Agricultural Outlook 2022-2031. 2022.**

121 WTO. https://www.wto.org/english/news_e/news20_e/ddgaw_30apr20_e.htm

122 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development. 2022.**

123 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development. 2022.**

124 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development. 2022.**



action to bridge the gap from both views, it will be possible to foster a more balanced, inclusive, sustainable, and resilient global food system^{125,126,127}.

Trade and Sustainability: A multifaceted relationship

Global food trade plays a crucial role in ensuring food security, but its relationship with sustainability is multifaceted. While trade can promote climate resilience and efficient use of natural resources, it can also exacerbate environmental challenges if not managed effectively¹²⁸. Trade leverages the concept of comparative advantage, which, in the sustainability aspect, means that countries specialize in producing food products for which they have a natural advantage due to factors like land and water resources. This specialization is particularly important because agriculture is a major resource consumer. It utilizes 40 percent of all global land use and 70 percent of the world's total freshwater withdrawals,¹²⁹ mostly for irrigation¹³⁰. Trade plays a key role in this resource distribution. Studies estimate that 37 percent of global agricultural land use and 29 percent of agricultural water withdrawals are linked to the international trade of food and agricultural products. This means that a significant amount of the resources used for agriculture are dedicated to producing food that is then traded internationally^{131,132}.

Countries with limited resources can leverage trade to access a wider variety and quantity of food than domestic production could sustain¹³³. For example, a country with limited arable land can import staple crops while exporting fruits or vegetables that thrive in its climate. This fosters a more efficient global allocation of resources, potentially reducing the overall environmental impact of food production. In a scenario where every country attempted to be self-sufficient in every food product, regardless of their resource limitations, this would likely lead to a much higher overall environmental footprint as countries with unfavorable conditions for certain crops would be forced to use more land, water, and other inputs to achieve lower yields¹³⁴. Moreover, as agriculture is highly vulnerable to climate shocks and natural disasters, trade can help mitigate these risks by allowing countries to import food during periods of local shortages caused by extreme weather events.

Trade can also be a key driver for disseminating technology and knowledge exchange. Advancements in resource-efficient practices and biotechnology can contribute to more sustainable agriculture. Trade policies that promote the transfer and adoption of these technologies, particularly in developing countries, can significantly reduce the environmental footprint of food production. Additionally, ecosystem services, which encompass the benefits humans derive from nature, can be a powerful tool in promoting sustainable practices. By placing a value on these services through market mechanisms, trade can incentivize producers to adopt practices that conserve and protect natural resources.

However, international food trade also has its challenges and complexities as the absence and non-compliance to proper regulations can lead to trade patterns that intensify environmental pressures on land and water resources. When the environmental costs of production are not factored into

125 OECD; FAO. **OECD-FAO Agricultural Outlook 2022-2031**. 2022.

126 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development**. 2022.

127 CLAPP, J. The State of Agricultural Commodity Markets 2015-16 Background paper: Unpacking disputed narratives. **FAO Food security and international trade**, dec. 2015

128 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development**. 2022.

129 2.5 percent of water on Earth is considered to be freshwater. Internal renewable water resources (IRWRs) from rivers and aquifers amount to 44 000 km³/year, and withdrawals (all sectors) exceed 4 000 km³/year, almost 10 percent of IRWRs. Agriculture represents 72 percent of those withdrawals, especially in Central Asia, the Middle East–Western Asia and Northern Africa. (27).

130 WTO. Available at: https://www.wto.org/english/news_e/news20_e/ddgaw_30apr20_e.htm

131 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development**. 2022.

132 CROPLIFE. **Croplife international recommendations to 13th wto ministerial conference negotiators**. 2023.

133 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development**. 2022.

134 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development**. 2022.



prices, trade can incentivize unsustainable practices such as deforestation, land degradation, and overuse of water.

Currently, regulations and classifications initiatives for sustainable practices lack consistency across different countries and regions. This creates confusion within the entire production value chain and hinders the harmonization of global trade rules on sustainability¹³⁵. Multilateral conversations involving governments, businesses, and international organizations are crucial to establish an effective, comprehensive, and systematic consensus on what constitutes sustainable agriculture, recognizing the equivalence of measures aimed at achieving the same goals and how these principles can be effectively integrated into trade policies in a timely order and predictable manner, ensuring the inclusion of small-holder farmers and LDCs.

Through consideration of those multilateralism principles and internalization of environmental externalities, trade can play a vital role in promoting long-lasting systemic transformation that ensures a more resilient and sustainable global food system that ensures food security for all while safeguarding the environment for future generations.

Seizing the opportunity

Over the past 30 years, trade in food and agricultural products has become an indispensable element of the global food system. This trend is likely to continue, especially as climate change disrupts agricultural production in some regions, potentially leading to food shortages. Trade acts as a powerful tool, shaping food security for nations across the globe. Its influence extends across all four dimensions of food security: availability, access, utilization, and stability. By facilitating the movement of food from regions with surpluses to areas experiencing deficits, trade offers a significant advantage: it has the potential to alleviate global hunger and promote a more efficient allocation of natural resources used for food production^{136,137,138}.

However, the relationship between trade and food security is not without its complexities¹³⁹. Trade liberalization can create both positive synergies and potential trade-offs. On the one hand, it can enhance food security by addressing shortages, increasing food diversity, and influencing dietary patterns. On the other hand, lower domestic food prices due to trade liberalization can sometimes discourage local production in some countries. Additionally, trade disruptions caused by conflicts, trade wars, or other events can significantly impact food security, particularly in countries reliant on imports.

Moreover, while trade allows countries with limited resources to access a wider variety of food, it's crucial to recognize the potential environmental consequences. Unsustainable trade practices can exacerbate environmental problems, such as deforestation or excessive water use. This, in turn, can undermine long-term food security by degrading the resource base needed for agricultural production. Here's where the implementation of trade policies that enforce the integration of sustainable practices into global trade and cooperation agreements is essential. These practices can enhance a country's comparative advantage in the long run by preserving the resource base (land, water, biodiversity) and improving resource efficiency through technologies and production methods^{140,141}.

135 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.

136 OECD; FAO. **OECD-FAO Agricultural Outlook 2022-2031.** 2022.

137 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.

138 WTO. Available: https://www.wto.org/english/news_e/news20_e/ddgaw_30apr20_e.htm

139 OECD; FAO. **OECD-FAO Agricultural Outlook 2022-2031.** 2022.

140 OECD; FAO. **OECD-FAO Agricultural Outlook 2022-2031.** 2022.

141 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.



Trade can also be a powerful tool for disseminating these sustainable practices. It can facilitate the spread of resource-efficient technologies and best practices from developed to developing countries, fostering collaboration and knowledge exchange on sustainable food production methods. However, to fully realize these benefits, a unified effort for defining and regulating sustainable practices is necessary. This will help to mitigate confusion for producers, consumers, and policymakers, and ensure global coherence in trade policies and regulations related to sustainability^{142,143}.

Ultimately, achieving food security in a sustainable manner requires a collaborative effort across the entire global food value chain. This includes producers implementing sustainable agricultural practices on their farms, industries developing and promoting sustainable food production systems and responsible sourcing practices, and consumers making informed choices that support sustainable food production through purchasing decisions.

To achieve this collaboration, several mechanisms can be employed, including value chain traceability, certification of food commodities based on sustainable production standards, and green trade corridors facilitating the trade of food products that meet specific sustainability criteria. These mechanisms can promote best sustainable practices across various areas, such as deforestation-free production, social responsibility, and biodiversity conservation. By working together to ensure compliance with WTO's international trade and by implementing these enablers, all stakeholders in the global food system can contribute to a future where trade and food security go hand in hand while safeguarding the environment for future generations.

142 OECD; FAO. [OECD-FAO Agricultural Outlook 2022-2031](#). 2022.

143 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. [The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development](#). 2022.



Advance the WTO’s rules-based multilateral agricultural trading system, eliminating market distorting barriers, while orchestrating sustainable practices adoption over time and guaranteeing food security. G20 members should foster global convergence on science and outcome-based sustainable food trade regulatory practices, methodologies, and taxonomies, anchored on the international trading system with WTO, and its international standard setting bodies, at its core.

Executive Summary

This policy action focuses on scaling sustainable practices in the agriculture and food industry through international trade, while guaranteeing food security. **G20 Members should:**

- a. Strengthen the WTO’s rules-based multilateral agricultural trading system, enabling inclusive and equitable trade and removing market-distortion barriers that can undermine the collective efforts necessary for a sustainable global food system.
- b. Agree on best science-based regulatory practices and interoperable taxonomies for the establishment of environmental measures, within the WTO’s multilateral trading system, reinforcing and improving existing standards.
- c. Define outcome-based sustainability goals for specific commodities that are responsible for most of the value traded internationally.

Background and Context

Strengthen the WTO’s rules-based multilateral agricultural trading system, enabling inclusive and equitable trade and removing market-distortion barriers that can undermine the collective efforts necessary for a sustainable global food system.

Strengthening the WTO’s rules-based multilateral trading system is essential for fostering a secure, sustainable, and prosperous global food system. It is imperative that G20 members prioritize the elimination of market-distorting barriers that hinder efforts toward this collective goal^{144,145,146}.

Multilateral trade agreements play a critical role in achieving this goal. By reducing tariffs and other trade barriers, these agreements promote increased trade flows, allowing countries to specialize in areas where they have a comparative advantage. This specialization leads to increased efficiency and productivity in food production, ultimately resulting in lower food prices for consumers worldwide. Additionally, for countries with limited domestic food production capabilities, open trade allows access to a wider variety of affordable food products, significantly contributing to food security. Furthermore,

144 OECD; FAO. [OECD-FAO Agricultural Outlook 2022-2031](#). 2022.

145 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. [The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development](#). 2022.

146 CROPLIFE. [Croplife international recommendations to 13th wto ministerial conference negotiators](#). 2023.



increased trade flows stimulate economic growth, generating income that can be reinvested in agricultural productivity and food security initiatives^{147,148}.

While the COVID-19 pandemic exposed vulnerabilities in overreliance on global food supply chains, open trade remains the most promising path toward a secure and prosperous global food system. However, trade disruptions can lead to price spikes and food insecurity, particularly for import-dependent countries. The key lies in responsible open trade liberalization. Responsible trade practices can promote open trade while simultaneously enhancing transparency and building resilience within the global food system. This will ensure a smooth and responsible trade transformation, mitigating risks and fostering a more sustainable food future^{149,150}.

It is also key that G20 members understand the potential effects of newly emerging environmental restrictions on production, transportation, trade patterns, prices, and market dynamics. Reviewing unilateral trade restrictions implemented by G20 countries in the past recent years and incorporating concerns raised by the private sector and relevant organizations assisting the WTO is essential to strengthen the WTO's multilateral trading system and its governance.

G20 members could develop contingency plans to mitigate risks arising from these environmental restrictions. Consider scenarios where certain commodities are affected by higher export prices due to non-compliance with the regulations. Identify cost-effective options for producers to engage in sustainable practices and enhance supply chain transparency to comply with these regulations. Initiate a process to review unilateral restrictive trade policies implemented by G20 countries in the last three years. This review should consider concerns brought by private sector representatives to their respective governments and to multilateral and plurilateral organizations that provide technical assistance to the WTO.

Finally, the B20 recognizes that the challenges posed by climate change can significantly impact international trade dynamics. Multilateral trade, complemented by regulations designed to achieve environmental goals and to implement countries targets under the Paris Agreement, can be a key tool for coordinating a global effort toward solutions. This approach will ensure that trade contributes to a sustainable food system that meets the needs of both present and future generations.

The B20 urges the G20 to work collaboratively to strengthen the WTO's multilateral trading system, which promotes equitable, inclusive and open trade while addressing environmental concerns. By acting together, it is possible to ensure a future where trade supports a secure, sustainable, and prosperous global food system.

Agree on best science-based regulatory practices and interoperable taxonomies for the establishment of environmental measures, within the WTO's multilateral trading system, reinforcing and improving the efficiency of international standard-setting bodies.

As highlighted earlier, global food trade is intricately linked to natural resource use, particularly land and water. While open markets can alleviate pressure on resources in some areas, export-driven production can also generate negative environmental externalities, including unsustainable freshwater withdrawals, pollution, biodiversity loss, deforestation, and greenhouse gas emissions (GHG)¹⁵¹.

147 OECD; FAO. [OECD-FAO Agricultural Outlook 2022-2031](#). 2022.

148 CROPLIFE. [Croplife international recommendations to 13th wto ministerial conference negotiators](#). 2023.

149 OECD; FAO. [OECD-FAO Agricultural Outlook 2022-2031](#). 2022.

150 CROPLIFE. [Croplife international recommendations to 13th wto ministerial conference negotiators](#). 2023.

151 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. [The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development](#). 2022.



Box 9 – Commodity-Related Tropical Deforestation and Conversion

Deforestation is a critical environmental challenge, with over 95% occurring in tropical regions¹⁵². Furthermore, the production of some of the world's most traded commodities—cattle, soy, and palm oil—drives over 60% of this loss. These statistics highlight the need for targeted solutions focused on key deforestation-related regions and products¹⁵³, hinged on collaboration between producer and consumer countries. This interconnectedness underscores the potential impact of collective action led by these leading regions. By working together, they can pave the way for more sustainable production practices¹⁵⁴.

Because of that, it is imperative that the G20 builds upon existing efforts and agree on best regulatory practices and interoperable taxonomies for defining environmental measures within the WTO's governance that fosters sustainable outcomes within the global food system. These measures should prioritize practicality, measurability, and predictability for businesses involved in trade.

The agreed upon best practices should establish minimum standards for environmental measures, according to the Paris Agreement and UN's SDGs, and recognize the equivalence of policies aimed at achieving common environmental goals, considering environmental externalities associated with a product throughout its lifecycle – from production and processing to transport. Five pillars should guide these practices' design¹⁵⁵:

- a. WTO & Science-Based Foundation:** Leverage existing WTO standards and the expertise of the "Three Sisters" (WOAH, IPPC, Codex Alimentarius) to establish science-based baselines for international trade. This would significantly reduce non-tariff barriers and encourage sustainable practices.
- b. Practical Integration:** Seamless integration into existing trade agreements is crucial for widespread adoption.
- c. Science-Based Approach:** Informed by the latest scientific research on sustainable agriculture practices and climate science.
- d. Measurable Progress:** Clear and measurable targets for progress toward sustainability goals are essential for tracking success and identifying areas for improvement.
- e. Predictable Stability:** Long-term stability and predictability for businesses will encourage responsible sourcing and investments in sustainable production methods.

Box 10 – WTO's "Three Sisters" - International standard-setting organizations¹⁵⁶:

The "Three Sisters" (WOAH, IPPC, and Codex Alimentarius) are international organizations that set science-based standards for safe and sustainable food trade under the WTO umbrella. By endorsing and upholding these international guidelines, G20 nations can significantly reduce trade barriers and promote sustainable practices in the global food system.

- a. The World Organization for Animal Health (WOAH) safeguards animal health, preventing the spread of animal diseases and promoting sustainable livestock practices.
- b. The International Plant Protection Convention (IPPC) focuses on preventing the spread of plant pests and diseases through trade, protecting plant resources, and contributing to food security.
- c. Finally, the Codex Alimentarius Commission (Codex) establishes food safety standards, ensuring fair practices and protecting consumer health in the international food trade.

152 FAO and OECD. Food Security and Trade 2023

153 PENDRILL, F. et al. Agricultural and forestry trade drives a large share of tropical deforestation emissions. *Global Environmental Change*, v. 56, p. 1-10, 2019.

154 PENDRILL, F. et al. Agricultural and forestry trade drives a large share of tropical deforestation emissions. *Global Environmental Change*, v. 56, p. 1-10, 2019.

155 CROPLIFE. *Croplife international recommendations to 13th wto ministerial conference negotiators*. 2023.

156 WTO. https://www.wto.org/english/tratop_e/sps_e/wkshop_oct09_e/wkshop_oct09_e.htm



Define outcome-based sustainability goals for specific commodities that are responsible for most of the value traded internationally.

In addition to the general agreement on best sustainability practices, countries should strive to establish specific sustainability goals for key traded agricultural commodities globally. This individual approach is crucial to consider the unique environmental challenges associated with each commodity in terms of the need for natural resources, including land and water, as well as GHG related to their production.

The B20 proposes establishing specific sustainability goals for the five key traded agricultural commodities, aligned with the Paris Agreement and with specific regional demands and existing programs^{157,158,159}:

- a. Soy, along with Palm Oil, represents 18 percent of total tropical deforestation globally, disrupting ecosystems and harming endangered species. Moreover, the implementation of innovative farming approaches can promote soil health and improved water management in soy production. Setting specific targets for minimizing environmental risks may foster more sustainable productivity growth.
- b. Wheat cultivation requires a lot of water, straining freshwater resources and potentially causing salinization. Converting natural habitats for wheat farming also contributes to wildlife habitat loss¹⁶⁰. (78)Wheat sustainability targets should relate to water use reduction, salinization control, and natural habitat protection.
- c. Beef is responsible for 40 percent of global tropical deforestation, especially in the Amazon rainforest. Additionally, cattle are a significant source of methane emissions, contributing to climate change. Overgrazing by cattle can also degrade land through erosion and desertification. Sustainable targets for cattle should focus on promoting deforestation-free supply chains and protecting rainforests to maintain biodiversity. Moreover, reducing methane emissions from cattle and promoting responsible grazing practices is key to mitigating climate change.
- d. Maize farming practices can contribute to nitrogen pollution in waterways due to heavy fertilizer use. Soil erosion, particularly on slopes, is another concern. Sustainable goals should be targeted towards reducing water pollution and soil erosion, allowing productivity gains, second harvest and the safe use of technologies such as biotechnology and regenerative agriculture.
- e. Palm oil, along with Soy, represents 18 percent of global deforestation, especially in Southeast Asia destroying rainforests, displacing wildlife, and releasing stored carbon. Targets should focus specifically on promoting deforestation-free supply chains.

By establishing unified best practices alongside specific sustainability goals for these key commodities, the G20 can lead the way toward a future where food trade and environmental sustainability go hand in hand. This will ensure a thriving global food system that meets the needs of present and future generations while protecting our planet's vital resources.

157 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022**: The geography of food and agricultural trade: Policy approaches for sustainable development. 2022.

158 CROPLIFE. **Croplife international recommendations to 13th wto ministerial conference negotiators**. 2023.

159 **Global Forest Watch**. <https://www.globalforestwatch.org/>

160 <https://www.sciencedirect.com/science/article/abs/pii/S0378377418316457>



Policy Action 3.2

Support actionable, science- and rules-based measures to enable sustainable practices adoption while facilitating market access within the advancements of the WTO's rules-based multilateral agricultural trading system. G20 members should foster the adoption of sustainable practices and facilitate market access by improving the efficiency of international standard-setting bodies and ensuring transparency through traceability and certification schemes.

Executive Summary

This policy action focuses on prioritizing measures to enable the implementation and adoption of sustainable practices in an inclusive manner that facilitates market access for small-holder farmers and LDCs. **G20 members should:**

- a. Advance inclusive defining principles for robust mutually accredited traceability systems that guarantee supply-chain monitoring and facilitate market access, aligned with the WTO's rules.
- b. Scale Certification Schemes that streamline trade flows of certified sustainable products, reducing costs and expediting market access for small-holder farmers and LDCs.
- c. Establish a Facilitated Green Trade mechanism that provides special conditions for sustainably certified food and agricultural products, and inputs, based on science and associated risk.
- d. Advocate for the strengthening of the WTO, prioritizing the restoration of the dispute settlement system and improvement in the efficiency of international standard setting bodies for food and agriculture.
- e. Work to guarantee the inclusion and adaptation of developing countries and LDCs into WTO's multilateral trading system, enabling enhanced market access and a path toward a more equitable and sustainable productivity growth cycle.

Background and Context

By prioritizing comprehensive compliance and implementation measures toward the agreement on best sustainable practices anchored on the WTO's multilateral trading system proposed in Policy Action 3.1, G20 members can ensure the proposed practices translates into tangible results on the ground. Transparent and accountable enforcement will be crucial for fostering a truly sustainable global food trade system. Building trust and ensuring environmental integrity are cornerstones of a successful sustainable food trade system. Without clear traceability and robust certification mechanisms, customers and consumers cannot be certain of the origin and environmental impact of their food choices. Similarly, weak enforcement mechanisms can undermine commitments to sustainable practices and create unfair advantages for those who disregard environmental regulations. The integration of digitalization in traceability and certification processes can significantly enhance transparency and accountability, enabling real-time monitoring and data-driven decision-making. This technological advancement ensures that all stakeholders have access to reliable information about the supply chain, thus bolstering trust and compliance. Ultimately, we might collectively fail to achieve 1.5o degree targets without these measures. The following steps address these challenges and pave the way for a more transparent and accountable global food trade system.



Advance inclusive defining principles for robust mutually accredited traceability systems that guarantee supply-chain monitoring and facilitate market access, aligned with the WTO's rules.

A growing wave of concern for the environment and climate is pushing consumers, regulators, and businesses alike to demand greater transparency in the food system. Consumers want to know the origins and environmental impact of the food they purchase. Regulators are enacting stricter environmental standards and requiring businesses to demonstrate compliance. Businesses, facing these new regulations and a more discerning consumer base, are increasingly recognizing the value of transparency in their operational models and setting deforestation and environmental-related targets. Traceability systems, tracking the journey of food from farm to table, are essential for all three stakeholders to achieve their goals and ensure a sustainable food chain¹⁶¹.

The B20 recommends that G20 countries align on principles and metrics that countries can agree would need to be captured to make a traceability system credible, robust, and accessible to farmers electronic tracking system to follow the origin and journey of food products throughout the supply chain. Standardizing data collection methods across participating countries ensures consistent and comparable information within these traceability systems. However, recognizing the challenges faced by LDCs and smallholder farmers in implementing complex digital tracking systems is crucial. The B20 suggests capacity-building programs to equip them with the necessary skills and technologies, as mentioned in Recommendation 1, and exploring alternative traceability solutions that are more appropriate for their scale of operation, considering the specific challenges smallholder farmers face, including limited affordable connectivity, lack of access to digital tools to manage their operations, and limited access to affordable financing to afford the required investments for implementation of robust traceability systems.

Regular independent audits and consumer-facing smartphone applications utilizing digital identifiers can further enhance the accuracy and transparency of these traceability systems. Improved transparency and monitoring will allow for the identification and correction of environmental violations within the supply chain. By addressing the specific needs of LDCs and smallholder farmers, the B20's proposal ensures a more inclusive and equitable approach to sustainable food trade^{162,163}.

Scale Certification Schemes that streamline trade flows of certified sustainable products, reducing costs and expediting market access for small-holder farmers and LDCs.

Credible, science-based sustainability certification schemes can play a vital role in promoting environmentally friendly agricultural practices. These certifications provide a trusted benchmark for consumers and businesses alike. However, the current landscape of sustainability certifications can be complex and fragmented¹⁶⁴.

The B20 recommends supporting the use and ongoing development of credible, science-based certification schemes tailored to specific commodities. Facilitating the mutual recognition of such certifications among G20 member countries streamlines trade flows and avoids duplication of efforts. Exploring the development of government-backed certification programs alongside existing voluntary schemes can provide a robust and reliable option for producers who may not have access to established voluntary schemes, with a particular focus on LDCs and smallholder farmers. Financial assistance programs to help LDCs and smallholder farmers cover certification costs can incentivize

161 UNECE. **Traceability for sustainable trade**. 2019. Available at: https://unece.org/fileadmin/DAM/trade/Publications/ECE_TRADE_429E_TraceabilityForSustainableTrade.pdf

162 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development**. 2022.

163 UNECE. **Traceability for sustainable trade**. 2019. Available at: https://unece.org/fileadmin/DAM/trade/Publications/ECE_TRADE_429E_TraceabilityForSustainableTrade.pdf

164 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development**. 2022.



participation while streamlining the certification process for these producers can further encourage their involvement¹⁶⁵.

Scaling up credible certification will promote the widespread adoption of sustainable agricultural practices. Mutual recognition will simplify trade and reduce unnecessary burdens on producers. Government-backed certification programs, with a focus on affordability and accessibility for LDCs and smallholder farmers, will ensure a more inclusive approach to sustainable food production. The use of credible, science-based sustainability certification schemes tailored to specific commodities will be scaled up. This includes promoting existing initiatives like the Roundtable on Sustainable Palm Oil (RSPO), while also facilitating the mutual recognition of such certifications among G20 member countries. To complement existing voluntary schemes, the development of government-backed certification programs should also be promoted. This would provide a robust and reliable option for producers who may not have access to established voluntary schemes¹⁶⁶.

Establish a Facilitated Green Trade mechanism that provides special conditions for sustainably certified food and agricultural products and inputs, based on science and associated risk.

Trade policies can play a significant role in incentivizing sustainable practices. Differentiation of treatment based on science and risk is a critical element of existing trade rules. Customs agents and agricultural inspectors should focus on products that potentially pose threats to plant and animal health or may be flouting environmental or other laws. Robust sustainability and traceability programs should measurably reduce the risk that products do not meet environmental standards and based on that assessment, could be afforded easier border treatment. Currently, there can be delays and inefficiencies associated with the movement of products certified as sustainable. The B20 recommends establishing a mechanism that prioritizes the expedited movement of food products and inputs certified as meeting the specific sustainability criteria. Streamlining customs procedures and facilitating efficient transportation infrastructure for these sustainable products are key aspects. Implementing pilot programs for facilitated green trade between G20 member countries allows for testing their effectiveness and sharing best practices for wider adoption. This mechanism will incentivize producers to adopt sustainable practices by rewarding them with faster and more efficient trade processes. This will encourage a shift toward a more sustainable global food supply chain^{167,168,169}.

Advocate for the strengthening of the WTO, prioritizing the restoration of the dispute settlement system and the improvement in the efficiency of international standard setting bodies for food and agriculture.

Effective enforcement mechanisms are essential for ensuring compliance with sustainability commitments. Weak dispute settlement processes can create uncertainty and hinder progress on sustainability goals. The B20 recommends a multi-pronged approach to strengthen dispute settlement mechanisms. This includes training dispute settlement bodies on the complexities of environmental issues and sustainable trade practices. Drafting clear and unambiguous language within trade agreements regarding sustainability commitments and enforcement procedures is also crucial^{170,171}.

165 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.

166 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.

167 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.

168 CROPLIFE. **Croplife international recommendations to 13th wto ministerial conference negotiators.** 2023.

169 CLAPP, J. **The State of Agricultural Commodity Markets 2015-16 Background paper: Unpacking disputed narratives. FAO Food security and international trade,** dec. 2015

170 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. **The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development.** 2022.

171 CROPLIFE. **Croplife international recommendations to 13th wto ministerial conference negotiators.** 2023.



The World Trade Organization (WTO) serves as the cornerstone of the global multilateral trading system. Its dispute settlement mechanism provides a neutral forum for resolving trade disagreements between member countries. In the context of sustainable practices adoption, a strengthened WTO dispute settlement mechanism can play a critical role in ensuring fair and equitable enforcement of science- and rules-based sustainability standards.

The current system, lacking a fully operational Appellate Body, undermines the enforceability and predictability of the multilateral trading system. We urge member governments to prioritize reform efforts and restore a two-tier dispute settlement process. This includes filling vacancies in the Appellate Body and exploring avenues to enhance efficiency, such as stricter timelines and page limits for submissions.

Furthermore, improving the efficiency of international standard setting bodies, the WTO's three sisters mentioned in box 10, is also key in guarantee to accelerate the path toward the adoption of sustainable practices. Thus, it is crucial that the G20 countries adhere to those science based international standard setting bodies, avoiding non-justified trade barriers that may come from overriding those standards.

Finally, overall WTO governance is crucial. Meaningful private sector engagement in committees and trade policy discussions will provide valuable insight. Additionally, ensuring effective notification, monitoring, and consultation processes fosters transparency and accountability. By implementing these comprehensive compliance measures, the G20 can ensure the proposed practices translates into tangible results on the ground. Transparent and accountable enforcement will be critical for fostering a truly sustainable global food trade system.

Work to guarantee the inclusion and adaptation of developing countries and LDCs into WTO's multilateral trading system, enabling enhanced market access and a path toward a more equitable and sustainable productivity growth cycle.

A successful sustainable food trade transformation must be inclusive and empower all actors within the system, particularly smallholder farmers and least developed countries (LDCs). While these groups face distinct challenges, their success is intertwined. Smallholder farmers, who constitute the backbone of global agriculture, are often concentrated in LDCs. This recommendation proposes a three-pronged approach to ensure their inclusion and adaptation^{172,173}(26, 27):

- a. Strengthening Market Information Systems for All:** Transparency and access to accurate market information are crucial for smallholder farmers and LDCs to make informed decisions and participate competitively in the global market. Existing market information systems, like the Agricultural Market Information System (AMIS), should be strengthened to provide data and analysis tailored to their needs. This includes information on sustainable practices, fair market prices, and emerging market trends. The G20 can play a vital role in advocating for AMIS to prioritize these aspects in its discussions on agriculture, climate, and the environment.
- b. Facilitating Market Access for Smallholders and LDCs:** Many smallholder farmers, particularly in LDCs, lack the resources and connections to access national and international markets. The B20 urges G20 members to support initiatives that bridge this gap. This can involve promoting farmer-owned cooperatives and producer organizations in LDCs that can aggregate production, negotiate better prices, and connect smallholders with buyers seeking sustainably produced goods. Investment in infrastructure development in rural areas of LDCs is also essential to improve access to markets and reduce post-harvest losses.

172 OECD; FAO. [OECD-FAO Agricultural Outlook 2022-2031](#). 2022.

173 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. [The State of Agricultural Commodity Markets 2022: The geography of food and agricultural trade: Policy approaches for sustainable development](#). 2022.



c. Knowledge Sharing and Innovation Transfer: Smallholder farmers in LDCs often lack access to the latest advancements in sustainable agricultural practices. The B20 emphasizes the importance of knowledge-sharing and innovation transfer initiatives that equip these farmers with the tools and skills they need to improve yields, reduce environmental impact, and adapt to climate change. This can involve South-South cooperation programs focused on knowledge exchange between LDCs and more developed countries, extension services tailored to local needs in LDCs, and capacity-building programs focused on sustainable resource management and the adoption of efficient technologies.

By implementing these measures, the G20 can foster a more inclusive and equitable food trade system. Empowered smallholder farmers and LDCs will be better equipped to contribute to global food security while adopting sustainable practices that protect our planet's resources. This will create a more resilient and sustainable food system for future generations.



ANNEXES



Annex A – Glossary

Data	Additional definition	Source
<p>Past Productivity Increase: As a result, food systems raised agricultural output by 150-200 percent while expanding croplands by 12 percent.</p>	<p>The world's agricultural production has grown between 2.5 and 3 times over the period while the cultivated area has grown by only 12 percent.</p>	<p>FAO (The State of The World's Land and Water Resources For Food and Agriculture - 2011)</p>
<p>GHG emissions: Food and agriculture collectively account for 30 percent of greenhouse gas (GHG) emissions.</p>	<p>"In 2021, global agrifood systems emissions were 16 billion tonnes of carbon dioxide equivalent (Gt CO₂eq), an increase of 14 percent since 2001. They represented 30 percent of total anthropogenic emissions (53 Gt CO₂eq). "</p>	<p>FAO (FAOSTAT - Emission totals)</p>
<p>Freshwater withdrawals: Represent 70 percent of global freshwater withdrawals.</p>	<p>Includes irrigation, livestock and aquaculture. Industries account for the other 19 percent and municipalities for 121 percent.</p>	<p>FAO AQUASTAT (FAO's Global Information System on Water and Agriculture)</p>
<p>Climate Finance: Current climate finance annual investments in food systems are approximately \$30 billion.</p>	<p>In 2019/20, agrifood systems - including agriculture, forestry, food loss/waste, low carbon credits, fisheries and aquaculture - received 4.3 percent of total global climate finance tracked at the project level, with an annual average of USD 28.5 billion.</p>	<p>CPI (Landscape of Climate Finance for Agrifood Systems - 2023)</p>
<p>Potential of regenerative agriculture on carbon sequestration: Advances such as regenerative farming have the potential to sequester a significant share of global GHG emissions, from 9-23 percent.</p>	<p>It is estimated that the global technical potential of Soil Organic Carbon sequestration is 1.45-3.44 Gt C (5.3-12.6 Gt CO₂) per year (Lal, 2018). This represents between 9-23 percent of the global total emissions (53 Gt CO₂) from all sectors in 2017.</p>	<p>FAO (Soil Organic Carbon: the hidden potential. 2017)</p>
<p>Food insecurity in "Rural and Traditional" countries: The median prevalence of moderate to severe food insecurity in "Rural and Traditional" food systems was around 70 percent in 2022.</p>	<p>Out of the 30 Rural and Traditional countries, 25 had available data in 2022. Considering the available data, the median prevalence of moderate to severe food insecurity was approximately 70 percent.</p>	<p>GAIN (The Food Systems Dashboard)</p>
<p>Components of future production increase: About 85 percent of the increase in global crop production in the next decade is expected to come from increases in yields and cropping intensity in agriculture.</p>	<p>Assuming continued progress in plant breeding and a transition to more intensive production systems, yield improvements are projected to account for 79 percent of global crop production growth, cropland expansion for 15 percent, and a higher cropping intensity of 6 percent over the Outlook period.</p>	<p>OECD and FAO (OECD-FAO Agricultural Outlook 2023-2032)</p>
<p>Contribution of the sector to the GDP for LDCs: Agriculture, forestry, and fishing in LDCs contribute 4.5 times more to GDP than the global average.</p>	<p>World average contribution of agriculture, forestry and fishing was 4.3 percent in 2022. In LDCs, the percentage was 19.4 percent.</p>	<p>FAO (FAOSTAT - Macro Indicator)</p>



Annex B – Composition and Meeting Schedule

Distribution of Members by country

Country	#
Argentina	9
Australia	2
Belgium	2
Brazil	35
Canada	2
China	3
France	9
Germany	5
India	18
Indonesia	3
Italy	6
Japan	1
Luxembourg	1
Mexico	1
Netherlands	1
Norway	1
Russian Federation	9
Saudi Arabia	1
South Africa	1
Sweden	2
Türkiye	1
United Kingdom	6
United States	15
Total	134

Distribution of Members by gender

Gender	#
Female	49
Male	84
Prefer not to inform	1



Task Force Chair

Name	Organization	Position	Country
Gilberto Tomazoni	JBS	CEO	Brazil

Task Force Deputy Chair

Name	Organization	Position	Country
Marcela Rocha	JBS	Executive Director for Corporate Affairs	Brazil
Jason Weller	JBS	Global Chief Sustainability	Brazil

Task Force Co-Chairs

Name	Organization	Position	Country
Agnes Kalibata	AGRA	CEO	Kenya
Livio Tedeschi	CropLife	Chairman of the Board	Germany
Lyu Jun	COFCO Corporation	Chairman	China
Pelerson Penido Dalla Vecchia	Grupo Roncador	Chairman	Brazil
Ramon Laguarta	PepsiCo	Chairman and Chief Executive Officer	
Rodrigo Santos	Bayer	Head of Crop Science Division and Member of the Board of Management	Alemanha
Sanjiv Puri	ITC Limited	Chairman and Managing Director	India
Sulaiman Al Rumaih	SALIC	CEO	Saudi Arabia
Gregory Heckman	Bunge Global S.A.	CEO	United States
Miguel Gularte	BRF S.A.	CEO Global	Brazil

Task Force PMO

Name	Organization	Country
Francieli Franciscatto Covatti Souto	National Confederation of Industry	Brazil



Task Force Members

Name	Organization	Position	Country
Achmad Solikhin	UN Decade on Ecosystem Restoration	Researcher	Indonesia
Achmad Solikhin	UN Decade on Ecosystem Restoration	Advisory Board	Indonesia
Adam Dow Jastrzebski	EDEN Partners	Founder/Visionary	Sweden
Agnes Vinblad	United States Council for International Business - USCIB	Policy Lead - Climate, Biodiversity and Environment	United States
Alfredo Miguel Neto	John Deere Brasil Ltda.	Director Corporate Affairs and Communications	United States
Aline Leão	Rede Brasil do Pacto Global	Sustainable Agriculture Manager	Brazil
Aloknath De	CTOLeadership and ex-Samsung	Director-CTO Leadership and Former CVP/CTO, Samsung	India
Amrendra Swaroop Mishra	Archer Daniels Midland Co. (ADM)	Managing Director & Country Manager	United States
Ana Carolina Lacerda	Câmara Árabe Brasileira de Comércio	Relações Institucionais	Brazil
Andre Costa Miranda	ADM	Senior Director Government Relations South America	United States
Andrey Guryev	Russian Fertilizers Producers Association	President of the Russian Fertilizers Producers Association	Russian Federation
Angela Fey	Novozymes	Regional Sustainability Manager	Brazil
Anilkumar S G	Samunnati	Founder & Group CEO	India
Anna Gubina	Russian Union of Industrialists and Entrepreneurs (RSPP)	Leading expert	Russian Federation
Anna Paula de Carvalho Losi	Associação Nacional das Indústrias Processadoras de Cacau - AIPC	Presidente Executiva	Brazil
Antonov Dmitry	"Resource", group of agriculture companies	Senior Vice-President. Head of GR Division	Russian Federation
Arlton Rocha de Sousa	BASF SA	Institutional Relations Manager	Germany
Arthur Martinho	IBREI - Brazilian Institute of International Business Development	Vice President and Board Member	Brazil
Arun Raste	NCDEX (National Commodities and Derivatives Exchange)	Managing Director & CEO	India
Balasubramanian Iyer	International Cooperative Alliance Asia and Pacific	Regional Director	India
Beatrice Lucarella	S.A.M. srl	institutional relations and corporate communication	Italy
Benjamin DOREILH	MEDEF INTERNATIONAL	Project manager Agriculture and Agrifood sectors	France
Bernardo Mendes de Oliveira e Silva	Sindicato Nacional da Indústria de Matérias-Primas para Fertilizantes - Sinprifert	Diretor Executivo	Brazil
Brenda Rühle	Tetra Pak	Head of Corporate Affairs	Sweden



Name	Organization	Position	Country
Bruno Henrique Maier	Raízen	Sustainability Coordinator	Brazil
Camila Valverde Santana Greve	Pacto Global da ONU no Brasil	COO	United States
Carla Gheler Costa	Brazilian Business Council for Sustainable Development	Coordinator	Brazil
Carla Martin Bonito	COPAL	Executive Director	Argentina
Chen Jinyuan	Xiamen Vangenes Biotech Co., Ltd.	Oversea Market Director	China
Cristiane Lopes	PepsiCo LTDA	Government Affairs and Public Policy Head	United States
Dany Mello Freire	UN Global Compact	Climate Manager	Brazil
Darci Vetter	PepsiCo	Senior Vice President, Head of Global Public Policy	United States
Darinka Anzulovich	Coordinadora de las Industrias de Alimentos y bebidas	Lic. en tecnología de alimentos	Argentina
Davide Calderone	Assica - associazione industriali delle carni e dei salumi	Director general	Italy
Didier Wladyslaw Bergeret	The Consumer Goods Forum	Director Sustainability	France
Diego Leal	BANDEX S.A.	director	Argentina
Dr Uttaam Siinghal (Uttam Singhal)	TWI GROUP OF COMPANIES	Group Managing Director & H.India Consul Gerogria BCAGC	India
Eduardo Leao de Sousa	CropLife Brasil	President and CEO	Brazil
Eliane Suzuko Hiratsuka Kay	Sindiveg - Sindicato Nacional da Indústria de Produtos para Defesa Vegetal	Executive Director	Brazil
Emily Rees	Croplife International	President & CEO	Belgium
Essam Algobaisi	Business Intelligence Group (BIG)	CEO	Saudi Arabia
Felipe Augusto Torres de Carvalho	Bayer	Public Affairs Specialist	Germany
Fernando Careli de Carvalho	Ferrero	South America Corporate Affairs Director	Luxembourg
Fernando couto	Faima	Director ejecutivo	Argentina
Fiona Duggan	Unilever	Global Sustainability Senior Manager - Climate Advocacy	United Kingdom
Gilson Araujo Junior	Comitê - CRISTO G20	Coordenador de Relações Internacionais	Brazil
Giuliano Ramos Alves	Brazilian Agribusiness Association	Manager	Brazil
GRAZIELLE TALLIA PARENTI	Syngenta	VICE-PRESIDENT SUSTAINABILITY AND CORPORATE AFFAIRS	Brazil
Gregoire Saint Gal de Pons	CNP Assurances Latam	Director of Institutional Relations, Communication and Sustainability	France
Guilherme Schmitz	Yara Brasil Fertilizantes S.A.	Market Development Director	Norway



Name	Organization	Position	Country
Gustavo de Oliveira Camargo	BRF SA	Corporate Affairs	Brazil
Helena Araujo	BRF S.A	Executive Manager	Brazil
Helga Flores Trejo	Bayer AG	Vice President, Head International & Multilateral Affairs	Germany
Ingo Ploger	ABAG	Vice President ABAG + President IPDES	Brazil
Isaac Quansah Aggrey	African Social Entrepreneurs Network	CEO	South Africa
Isabel Blazquez Solano	Aon Resseguros	CEO Aon Re	United Kingdom
Ivan Zhidkikh	Russian Union of Industrialists and Entrepreneurs (RSPP)	Executive Secretary of the RSPP Committee on Climate Policy and Carbon Regulation	Russian Federation
Jayesh Shinde	Waycool Foods	Head of Strategic Communications and Advocacy	India
João Batista Ferreira Dornellas	ABIA Brazilian Food Industry Association	Executive President	Brazil
João José Prieto Flávio	Organização das Cooperativas Brasileiras	Coordinator of the Agriculture Sector	Brazil
Juan Carlos Thompson	Latin-American Association of Responsible Self-Care	Executive President	United States
Karla Tiemi Oura Alves de Melo	BASF	Corporate Government Relations Coordinator	Germany
Kevin Langley	Louisiana Beekeepers Association	Vice President	United States
Kshitij Anand	Aon	Head of International Strategy	United States
Laura Barcellos Antoniazzi	Agroicone	Sênior researcher and partner	Brazil
LI NA	Hong Kong Southern Dipper Group Limited	CEO	China
LI, Xiaofeng	China Council for the Promotion of International Trade	Chief of Division	China
Liam MacDonald	Canadian Chamber of Commerce	Policy Advisor	Canada
Lígia Dutra Freyesleben Silva	Cargill Agrícola	Government Relations Director	United States
Lin KANG	AIGCC	Program Manager	Australia
LOIKOV Sirozhiddin	PJSC PhosAgro	First deputy CEO	Russian Federation
Mahran dawood	Bpp	Agriculture	United Kingdom
Marcelo Elizondo	Cámara Argentina de Comercio y Servicios	Pro-Secretary II	Argentina
Marcos Pupo Thiesen	Fiep (Industries Federation of Paraná State)	Environment and Sustainability Coordinator	Brazil
Marcos Sawaya Jank	INSPER University College on Economics, Business, Law and Engineering	Senior Professor of Global Agribusiness	Brazil



Name	Organization	Position	Country
Maria Eugenia Wolcoff	CREA	Institutional Relations & Public Affairs	Argentina
Marilia Robles Peixoto	The HEINEKEN Company Brasil	Government Relations Manager	Brazil
Mario Cerutti	Lavazza SpA	Director of Sustainability and Institutional Relations and Secretary of Lavazza Foundation	Italy
Mario Guiseppi Pennisi	Biostate Pty Ltd	Managing Director	Australia
Mark Ball	Syngenta Group	Global Head of Public Affairs	Belgium
Martin Schäfer	BASF SE	Head of Trade and Food Value Chain Affairs Agricultural Solutions	Germany
Masaya Sato	Keidanren (Japan Business Federation)	Co-Director	Japan
Melissa Souza	ABIHPEC	Manager	Brazil
Metin Akman	Oecd Business BIAC / TUSIAD / Anako AS	Chairman of Board	France
michele n de oliveira	Agência Fecunda	Specialista in new narratives	Brazil
Michelle Lai	Condé Nast	Global Director of Sustainability, Global Public Policy	United States
Miguel Angel Vargas Cruz	Grupo Alianza Empresarial	PRESIDENT	Mexico
Mikhail Sterkin	PJSC Phosagro	Deputy CEO for sales and marketing	Russian Federation
Monique Gonçalves	Shell Brasil	Government Relations and Policy & Advocacy Manager	United Kingdom
Muhammad Alpian	Window of Indonesia	CEO	Indonesia
Nicolis Amaral de Araujo	Firjan	Analista senior	Brazil
Okan Pala	Kale Group of Companies	Social Entrepreneurship Programmes Manager	Türkiye
Paloma Ochoa	Group Of Producing Countries from The Southern Cone (GPS)	SPECIALIST IN INTERNATIONAL TRADE	Argentina
Pedro Antonio Munhoz Werneck	Brazilian Insurance Confederation (CNseg)	Sustainability Specialist	Brazil
Phil O'Reilly	Iron Duke Partners	Managing Director	France
Piruz Areez Khambatta	Rasna Pvt.Ltd.	Group Chairman	India
Prashant Parameswaran	Tata Consumer Soufull	MD & CEO Tata Consumer Soufull	India
Priti Shokeen	TD Asset Management	Head of ESG	Canada
Rafael Campolina Melo	Tereos	Sustainability Executive Manager	France
Raul Andres Roccatagliata	Sociedad Rural Argentina	Head International Affairs & Trade	Argentina
RHEA MAZUMDAR SINGHAL	ECOWARE	Founder, CEO	India
Richardot Valentine	Association nationale des industries alimentaires	Export manager	France



Name	Organization	Position	Country
Ritesh Reddy Seri	Hindustan Petroleum Corporation Limited (HPCL)	Engineering Officer	India
Rogério de Souza Cunha	Centre For The Brazilian Tanning Industry / Cicb	TRADE INTELLIGENCE MANAGER	Brazil
Rokas Morkunas	Business at OECD (BIAC)	Policy Manager and Strategic Member Engagement	France
Ronan Teixeira Damasco	Microsoft	National Technology Officer	Brazil
Royston Braganza	Grameen Impact Capital	CEO	India
Sandeep Kedari	Laazmi Food Innovations Pvt Ltd	Director	India
Sanjay Sacheti	Olam Agri india Pvt Ltd	Country Manager	India
Sanjeev Asthana	Patanjali Foods Limited	Chief Executive Officer	India
Sanjiv Kanwar	Yara Fertilisers India Pvt Ltd	Managing Director	India
Sanjiv Lal	Rallis India Ltd	MD & CEO	India
Sara Roversi	Future Food Institute	President	Italy
Sebastian Ferrari	ICC Agri-Food Hub	Project Leader	France
Sergey Kudryashov	PJSC PhosAgro	ESG head	Russian Federation
Sharabaika Aliaksandr	PhosAgro	Deputy CEO for Finance and International Projects	Russian Federation
Silvia Susana Chus	ARTE DULCE S.A	Co-Founder and Director of ARTE DULCE S.A (Brand: Cielos Pampeanos) and Presient of the Department of Iternacional Trade of the Union Industrial of Buenos Aires	Argentina
Sophie Marshall	The B Team	Climate Strategist	United States
Sueme Mori de Andrade	Confederation of Agriculture and Lifestock of Brasil - CNA	International Relations Director	Brazil
Sumeet Mittal	Louis Dreyfus Company	CEO - India	Netherlands
Susana Sueldo de Ecclestone	Harrington Blue & Partners	CEO	United Kingdom
SUSHIL LODHA	Miracle Ingredients Llp	MD	India
Tania Strauss	World Economic Forum	Head of Food and Water	United States
Tara Nathan	Mastercard	EVP of Digital Solutions for Development and Founder of Community Pass	United States
Teresa Cristina Vendramini	Embrapa	Conselheira	Brazil
Vanessa de Souza Pereira	Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável - CEBDS	Head of Biodiversity	Brazil
Vincenzo Petrone	Petrone Group Srl	CEO & CTO	Italy
Vishal Anand	Reliance Industries Limited	R&D Planning & Strategy Head	India
Vito Villar	Associação Brasileira da Indústria de Café Solúvel - ABICS	International Trade Consultant	Brazil



Name	Organization	Position	Country
Vittorio D'Amore	Tecnocap Group	Sustainability and Stakeholder Manager	Italy
Wilson Nascimento	Brasilprev Seguros e Previdência S/A	Administration Manager	Brazil
Zamir Bolysbek	Center of external economic relationships	Director	United Kingdom
Zenaide guerra	dsm-firmenich	Director Americas	Brazil
Zhavoronkov Semen	Association of Association of Veterinary Pharmaceutical Manufacturers (AVPHARM)	Executive director	Russian Federation

Task force Meetings Schedule

Data	Format
26 February 2024	Virtual
21 March 2024	Virtual
22 April 2024	Virtual
16 May 2024	Virtual
13 June 2024	Virtual



Annex C – Partners

Knowledge Partner



Network Partners



With the technical cooperation of



