



# CEO Guide to Food System Transformation

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# A CALL TO ACTION FOR BUSINESS LEADERS

## Increasing urgency for food system transformation

Humanity's future depends on its ability to create **a food system that supports healthy people and a healthy planet.**

The need for urgent change is not always obvious. However, current food systems are **outstripping the planet's resources** while current diets are resulting in **global health crises** of both over- and undernutrition.

Continuing population growth and changes in dietary habits will amplify these crises.

Major **scientific and economic** reports (i.e., [Intergovernmental Panel on Climate Change \(IPCC\)](#), [World Resources Institute \(WRI\)](#), [Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services \(IPBES\)](#), [Food and Land Use Coalition \(FOLU\)](#), [EAT-Lancet](#)), are all sounding a clear alarm on the **urgent need to act today.**

**Public opinion and consumer demands** are increasing pressure while innovation and technology are creating business opportunities.





## Pathways for food system transformation

The **food system includes everything involved in feeding people and animals**, from growing and harvesting to processing, trading, marketing, distribution, consumption and disposal. It is deeply connected with agriculture, land use and working forests for non-food purposes, such as timber and fiber, as competition increases for fertile land.

A healthy food system is one with **inclusive outcomes for healthy people and a healthy planet**, and of course healthy businesses.

The science is now clear.

In this Guide we share the **seven pathways** identified across the value chain where business must lead action on critical issues in the food system. Executing on all pathways will drive **system transformation** and ensure the achieving of the Sustainable Development Goals (SDGs) and the Paris Climate Agreement.

## Success will require an integrated approach to transformation

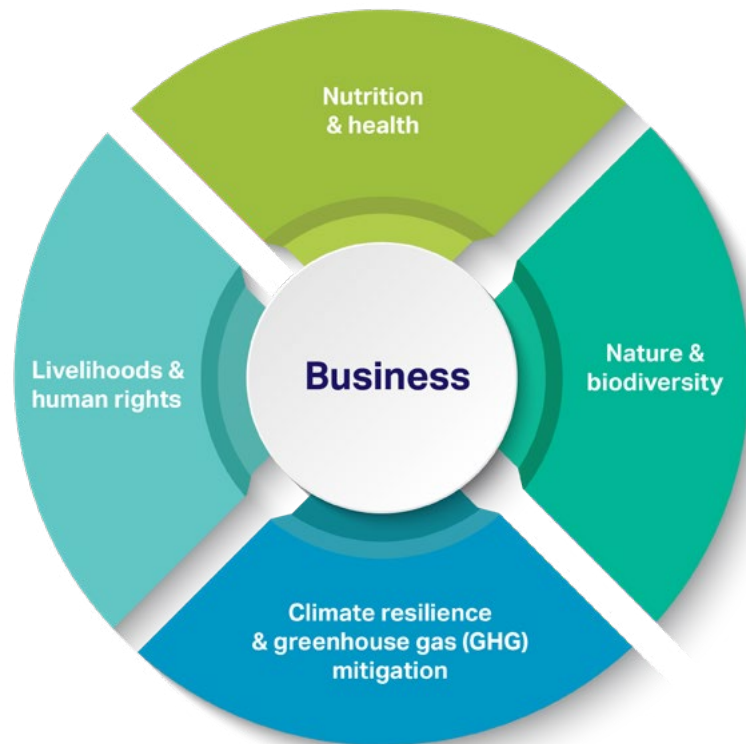
**Pioneering businesses** are already leading system changes across seven pathways, overcoming barriers (e.g., consumer and farmer disconnects, short-term economic pressures) and gaining **strategic advantage**.

This is not simply an individual business risk. For some farmers and businesses this will be very disruptive. But inaction will result in the food system risking its **collective license to operate**.

Achieving the [Food & Nature Program's Healthy People, Healthy Planet](#) vision will require unprecedented global collaboration, which must urgently move several system transformation levers at the same time.

Actions must address climate resilience and mitigation, nature and biodiversity loss, livelihoods and human rights, along with nutrition and health while respecting local cultural identity. These actions need to be bold and will require strong business leadership.

## Healthy People, Healthy Planet, Healthy Business



## CEOs must lead change from within and together

1. Understand your company's link to food system challenges and role in the seven transformational pathways
2. Set robust targets which reflect the true financial value of externalities and which are science-based
3. Develop and implement scalable solutions to achieve the targets
4. Lead your industry to accelerate the adoption of solutions
5. Bring a leading voice to global events as a champion of food system transformation
6. Work with WBCSD's Food & Nature Program to deliver impact at scale

**This CEO Guide outlines how to achieve shared goals for food system transformation**



# THE CASE FOR **FOOD SYSTEM TRANSFORMATION**

The world has been focused on driving productivity to meet the increasing food security needs of a growing world population...

**9+ billion people**

can be fed with the amount of calories produced today<sup>1</sup>

... but environmental stress is increasing globally...



**23%**

of global GHG emissions attributed to the food system<sup>2</sup>



**75%**

of land substantially degraded, with significant contribution from agriculture<sup>3</sup>

... the security of future supply is in question...



**50%**

of food-insecure nations are experiencing lower crop production<sup>4</sup>



**>75%**

of food comes from 4 major crops, a major concentration risk<sup>5</sup>

... hunger and poverty challenges are still prevalent...



**22%**

of children under 5 affected by stunting due to malnutrition in 2018<sup>6</sup>



**80%**

of extreme poor live in rural areas, depending primarily on agriculture<sup>7</sup>

... and the food produced is contributing to a global health crisis...



**2+ billion**

people lack micronutrients needed for growth<sup>8</sup>



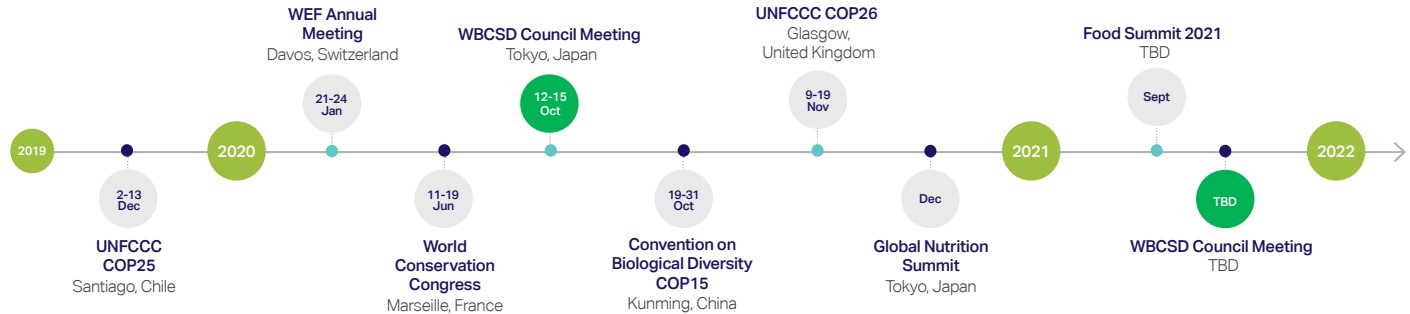
**75%**

of people suffer poor health linked to being overweight<sup>9</sup>



# The urgency for change is now clear and action is inevitable

In the next two years, organizations will hold a series of important global events where leaders will set a new direction for the food system at the intersection of the climate, nature and food agendas. Leading CEOs must call for a high level of ambition and action from fellow business leaders across the food, agriculture and forest sectors, pension funds and investors, as well as governments and cities.



**Humanity must transform the food system by 2030 to achieve the SDGs and ensure it can support healthy people and a healthy planet**

## While there are many challenges in the complexity of food system transformation, there are also promising consumer trends that signal ways to accelerate efforts



# The food and agriculture sectors have underinvested in and underleveraged nature-based solutions, technology and innovation particularly in ways that are inclusive, climate smart and regenerative

## Business is signaling the future of the food system but must accelerate the scaling of solutions

### Businesses are already leading in technology and innovation



Using a fully [automated drip irrigation system](#) that delivers water directly to the root zone



Leveraging the [IBM Food Trust](#) blockchain initiative to improve food traceability across supply chains enabling consumers to directly support farmers



Harnessing [infrared-drying technology](#) to rescue food waste and convert it into powders for beverages and snacks



Enabling a fossil-free food chain by piloting and launching the world's first [mineral fertilizer](#) made with renewable energy



Piloting a [blockchain wallet](#) solution that provides farmers in East Africa with access to financing



Investing in new [alternative protein](#) innovation



#### Agri-input/upstream

e.g., agricultural drones, precision agriculture, farm analytics, input and feed innovation



#### Supply chain

e.g., traceability technology, process automation, digital marketplaces, capacity building



#### Downstream

e.g., personalized diets using health markers, lab-grown meats, food label and waste tracking



### But activists and NGOs are creating pressure for which business must be prepared

NGOs are using drones to spot illegal deforestation and fishing activity in partnership with regulators, and are leveraging digital marketing to create demand for transparency and labeling accuracy (i.e., for meat and fish)

# For business to thrive in the long term it must address its material impacts while delivering integrated solutions aligned with global agreements and frameworks

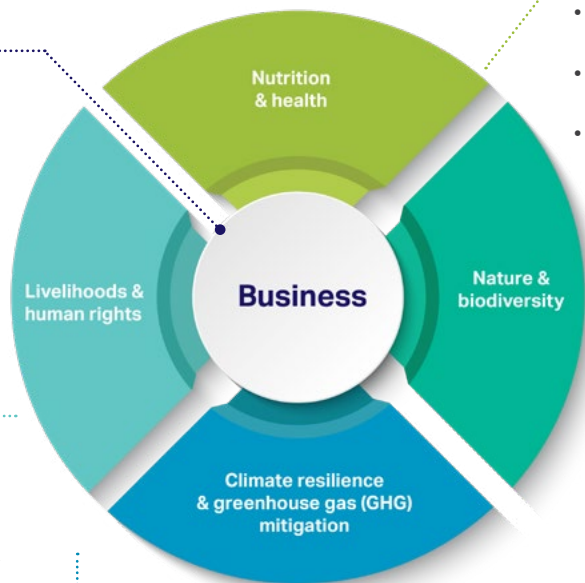
Goals are grounded in science and must deliver against the SDGs, Paris Agreement and developing biodiversity targets

## Sustainable business value creation

- Drive profits, returns and investment case to be sustainable
- Include the externalities of natural, social and human capital in management accounts
- Include risks in enterprise risk management systems
- Ensure cost of capital reflects the sustainability performance of the business, in addition to financial returns

## Livelihoods & human rights

- Double agricultural productivity and income of small-scale food producers **2.3**
- Halve the proportion of people living in poverty in the food system **1.2**
- Eradicate forced labor and modern slavery in agriculture **2.7**



## Nutrition & health

- Ensure access by all people to safe, sufficient and nutritious food year-round **2.1**
- End all forms of malnutrition, including stunting **2.2**
- Halve food loss and waste **12.3**



## Nature & ecosystems

- Halve the rate of loss of natural habitats, and significantly reduce land degradation (Aichi Biodiversity Target 5)
- Maintain genetic diversity of seeds, plants, and farmed animals **2.5**
- Ensure sustainable food systems that maintain ecosystems, are resilient to climate change, and improve land and soil quality **2.4**
- Promote sustainable management of forests, halt deforestation, restore degraded forests and substantially increase reforestation **15.2**

## Climate resilience & GHG mitigation

- Ensure sustainable food systems that maintain ecosystems, are resilient to climate change, and improve land and soil quality **2.4**
- Mitigate GHG emissions in agriculture and land use for a 1.5 °C pathway (Paris Agreement)



**Nestlé believes that protecting and restoring biodiversity is essential to safeguard food production and food security now and for the future. Nestlé has for many years worked with farmers to manage their land sustainably and will continue to lead activities enhancing biodiversity.**

**Mark Schneider**  
CEO, Nestlé S.A.



# SEVEN PATHWAYS WHERE BUSINESS CAN LEAD TO ACCELERATE TRANSFORMATION

PRODUCTION

CONSUMPTION

## Direct pathways

1 Transform **agriculture** while **restoring the environment** 3 **Shift diets** to be healthy and sustainable

2 Enhance **equitable distribution** of value

4 Minimize **food loss and waste**

## Enabling pathways

5 Build end-to-end **transparency**

6 Accelerate **policy and financial** innovations

7 Launch new **business models** and **value chain collaborations**

**The business-led solutions in these pathways must deliver the goals for people, climate and nature. While there will be trade-offs to address, those companies that lead, managing through the disruption, will thrive.**

**DIRECT PATHWAYS**

- 1 Agriculture transformation**  
Adopt transformative inputs and farming techniques and optimize crop varieties/mix to local conditions in both agri- and aquaculture while restoring the environment
- 2 Equitable value distribution**  
Deploy contracting practices, educational approaches and new technologies to create equitable distribution of value for farmer livelihoods and rural communities
- 3 Dietary shifts**  
Support consumers to make healthy and sustainable dietary choices, while shaping demand through new product formulations and effective marketing
- 4 Food loss and waste**  
Minimize food loss and waste across the system by reducing supply chain inefficiencies, adopting the bioeconomy and increasing awareness of producers and consumers

**ENABLING PATHWAYS**

- 5 Transparency**  
Build visibility and traceability across the value chain with new levels of data to assure sustainable sourcing, increased farmer income, decreased food fraud, reduced food loss and waste and greater consumer awareness
- 6 Policy and finance**  
Accelerate and strengthen policy and financial mechanisms to stimulate food system transformation, ranging from basic to cutting edge
- 7 New business models**  
Establish new business models that allow for better consideration of externalities to reflect true value and that create deeper collaboration with diverse stakeholders across sectors

# OPPORTUNITY FOR BUSINESSES TO LEAD

**Businesses should lead the food system transformation. Companies in the food and agriculture sector must collectively ensure their license to operate**

Food and land-use systems generate “hidden” environmental, health and poverty costs estimated at almost USD \$12 trillion a year. Executing these transformational pathways improves risk management. When successful, they will also deliver strategic business advantage and long-term value creation, rewarding companies through improved cost of capital and performance.



**USD  
\$4.5 trillion**  
per year by 2030<sup>17</sup>  
in emerging  
opportunities

**Delivering these transformation pathways could unlock USD \$4.5 trillion in new business opportunities each year by 2030. At the same time, this will save USD \$5.7 trillion a year in damage to people and the planet by 2030, more than 15 times the investment cost of up to USD \$350 billion a year.**





**Having transparency is fundamental. You need to bring multiple independent players to the table and align on what is best practice.**

**Ruth Kimmelshue**  
Senior Vice-President,  
Business Operations and Supply  
Chain, Cargill



**Through our dialogue with retailers and consumers, we will seize the huge opportunity that modern feed diets have for healthy nutrition and a healthy planet.**

**Johann-Caspar Gammelin**  
Chairman of the Board of  
Management, Evonik Nutrition  
& Care GmbH



## 1 Transform **agriculture** while **restoring the environment**

Adopt **transformative inputs and farming practices** and optimize crop varieties/mix **to local conditions** in both agri- and aquaculture while restoring the environment

### Solution areas

- **Develop transformative inputs for nutrition, nature and climate (seeds, feeds, fertilizers)**
- **Deploy and scale solutions:**
  - Circular nutrient management
  - Climate-smart agriculture
  - Regenerative practices and rebalancing seeds and crop diversity
  - Technology and finance innovation
- **Rebalance production to optimize crop mix based on local conditions and nutritional value**
- **Generate value by investing in approaches that:**
  - Deliver natural climate solutions
  - Improve biodiversity and create nature-based solutions
  - Maximize bioeconomy benefits

### Digital platform for sustainable agriculture

Nutrien partnered with ADM and General Mills on a project in the wheat growing region of Kansas. Using Nutrien's digital platform for sustainable agriculture, farmers measured the effects of management practices on eight environmental indicators. In two years, the project grew to involve 91 farms producing almost 14 million bushels of wheat. Farmers in the project reduced fuel consumption by 140,390 gallons, increased yields by 10% and learned how their practices affected their greenhouse gas emissions, water quality and nitrogen use efficiency.



**DSM is committed to working with partners and contributing to transforming our food systems by driving sustainable standards in food production and providing for accessible and affordable healthy diets for all.**

**Feike Sijbesma**  
CEO and Chairman, DSM



## 2 Enhance **equitable distribution** of value

Deploy contracting practices, educational approaches and new technologies to create equitable distribution of value for **farmer livelihoods and rural communities**

### Solution areas

- Introduce cost-effective technology for on-farm data management and to-farm traceability
- Leverage and scale insurance and finance mechanisms
- Build capacity with smallholders for the adoption of locally appropriate new practices and technologies
- Create sustainable and longer term contracting practices to share value equitably through to farm
- Assess and strengthen resilience in supply chain
  - Climate resilience
  - Gender equity
  - Hunger alleviation

### Connecting smallholder farmers to markets

Smallholders were concerned that intermediaries and speculative players were affecting price and transparency. **Olam's** Digital Origination tech platform, connects farmers directly with Olam to ensure a fair sourcing process and improve traceability. More than 40,000 cocoa farmers in Indonesia registered in 2018. The platform also created 1,000 cocoa micro-collectors, many of whom were previously working as small intermediaries, lacking stable income. In addition, Olam opened 80+ Collection Centers, engaging farmers and providing extra income by leasing space. Benefits for Olam include more efficient aggregation and distribution.



**For social and environmental stability, it is key that industry and governments empower smallholder farmers to increase the income generated by their farm through diversified farming.**

**Antoine de Saint-Affrique**  
CEO, Barry Callebaut



### 3 **Shift diets** to be healthy and sustainable

Support consumers to make **healthy** and **sustainable dietary choices**, while **shaping demand** through new product formulations and effective marketing

#### **Solution areas**

- **Shape demand through product formulations and distribution**
  - Affordability and accessibility
  - Locally relevant, highly nutritious and diverse ingredients
- **Support consumers and adjust portfolio mix to enable dietary choices that are:**
  - Healthy (e.g., low sugar/salt, more micronutrients)
  - Sustainable (e.g., sustainably reared livestock)
  - Diversified (e.g., nuts, fruits, legumes)
- **Optimize protein mix balanced with sustainably grown plant and animal proteins**

#### **Fortified rice helps people reach their full potential**

Globally, 2 billion people lack sufficient vitamins and minerals in their diets, leading to higher risks of stunting, anemia and other diseases. Vegetables, fruits and nuts high in these essential nutrients are often not accessible or affordable, especially in developing countries. Fortifying rice with vital micronutrients is an effective, affordable and scalable solution and a great way to reach people at scale. In Bangladesh, an estimated 60 million people are undernourished. By working with governments, the United Nations World Food Program and worker nutrition programs, **DSM** is able to reach 2 million Bangladeshis with fortified rice.



**Consumer trends are evolving very fast now and young consumers are demanding radical transparency.**

**Kees Aarts**  
CEO and Founder, Protix

## 4 Minimize **food loss and waste**

Minimize **food loss and waste** across the system by reducing supply chain inefficiencies, adopting a circular bioeconomy and increasing producer and consumer awareness

### Solution areas

- **Set goals, measure and use technology across the supply chain to reduce food loss and waste**
  - Including end-of-life product management practices
- **Improve storage and supply chain infrastructure (especially cold chain) and reduce supply chain inefficiencies**
  - Including circular bioeconomy practices
- **Improve date labeling and portion size data, driving consistency and clarity for consumer behavior change**

### Reducing food loss and waste in the milk supply chain

By using the [Food Loss and Waste Value Calculator](#), Nestlé was able to translate food loss and waste reduction to environmental and nutrition impacts in its milk supply chain in 30 countries. For example, Nestlé was able to avoid the loss of 599 tonnes of protein, which is equivalent to one day's protein requirements for 11.2 million people. It also avoided indirect emissions of 27,000 tonnes of CO<sub>2</sub> equivalent in terms of milk produced, which is about the same as eliminating 2,470 trips around the world in a small car.



**Food loss and waste is one lever with the best opportunity to set quantifiable targets and tangible actions.**

**Wiebe Draijer**

Chairman of the Executive Board,  
Rabobank

## 5 Build end-to-end **transparency**

Build **visibility and traceability across the value chain** with new levels of data to assure sustainable sourcing, increased farmer income, decreased food fraud, reduced food loss and waste and greater consumer awareness

### Solution areas

- Develop technology-enabled end-to-end traceability to track comprehensive and consistent data across the supply chain
- Test and scale distributed ledger technology that shares, aggregates and analyzes data to strengthen value chain linkages
- Create cost-efficient food testing and monitoring solutions
  - Improve food safety
  - Reduce food loss and waste

### Supply chain transparency: from cocoa farm to customer

Cargill uses sustainability data management to improve traceability in the cocoa supply chain. The approach uses software to collect and manage data about individual farms and farmers, household members, communities, cooperatives and social infrastructure. It links up information across different initiatives – such as the Child Labor Monitoring & Remediation System. This data allows Cargill to continue to design and refine its sustainability programs and helps customers choose sustainable products with confidence, enabling the third-party certified sustainable sourcing of 48% of Cargill's cocoa volume globally.



**With today's technologies and practices, highly productive farms can coexist with a thriving natural environment. Together, we can make this happen.**

**J. Erik Fyrwald**  
CEO, Syngenta AG



## 6 Accelerate **policy and financial** innovations

Accelerate and strengthen **policy and financial mechanisms** to stimulate food system transformation, ranging from basic to cutting edge

### Solution areas

- Leverage the momentum of global events with specific policy asks to accelerate action from:
  - Basic expectations, such as land rights,
  - New policy frameworks
  - Coherence across agency agendas
- Create and scale financial instruments to manage risks, improve flows and link cost of capital to improved outcomes
- Develop financing approaches for smallholder adoption; de-risk the changes

### Sustainability-linked finance

**COFCO International**, a global agribusiness, has partnered with a consortium of 21 banks to create a USD \$2.3 billion sustainability-linked loan as the company's core financing facility. Under the terms of this loan, COFCO will pay a lower interest rate if it achieves a year-on-year improvement in environmental, social and corporate governance (ESG) performance, and increases the traceability of agricultural commodities, with a focus on directly sourced soy in Brazil.



**Resetting from within the business community is often most powerful. If we have 50 fast-track leaders from 200 WBCSD members, and they all agree, then we will see change.**

**Jeremy Oppenheim**

Founder and Managing Partner,  
SYSTEMIQ



## 7 Launch new **business models** and **value chain** collaborations

Establish new business models that allow for better consideration of externalities to reflect true value and that create deeper collaboration with diverse stakeholders across sectors

### Solution areas

- Reshape business, portfolio and value chain for resilience and advantaged performance
- Launch cross-value-chain collaborations with innovative economics to de-risk innovations, scale solutions faster, and reach the last mile (both farmer and consumer)
- Include externalities in financial performance assessment to reflect true value
- Use the circular bioeconomy to alleviate resource supply risks, shift from fossil-fuel and non-renewable resources to sustainable, renewable biomass, repurpose agricultural waste and recycle nutrients

### Made in Farm

**Bayer's** Made in Farm online platform connects smallholder farmers directly with consumers or traders. The platform helps farmers and buyers meet, negotiate and close deals online, while also displaying offers from farmers who are encouraged to add information regarding production, such as location and post-harvesting treatments. To date, the platform has seen more than €10 million in transactions and connected 13 million consumers.



**Nutrien is committed to sustainable agriculture. Getting it right is both an environmental necessity and a business opportunity that benefits us all.**

**Chuck Magro**  
CEO & President, Nutrien







**It is possible to have both economic viability and sustainability; but to accomplish this, incentives need to be set and we need to work together across the value chain.**

**Amy Senter**

Chief Sustainability Officer,  
Kellogg Company

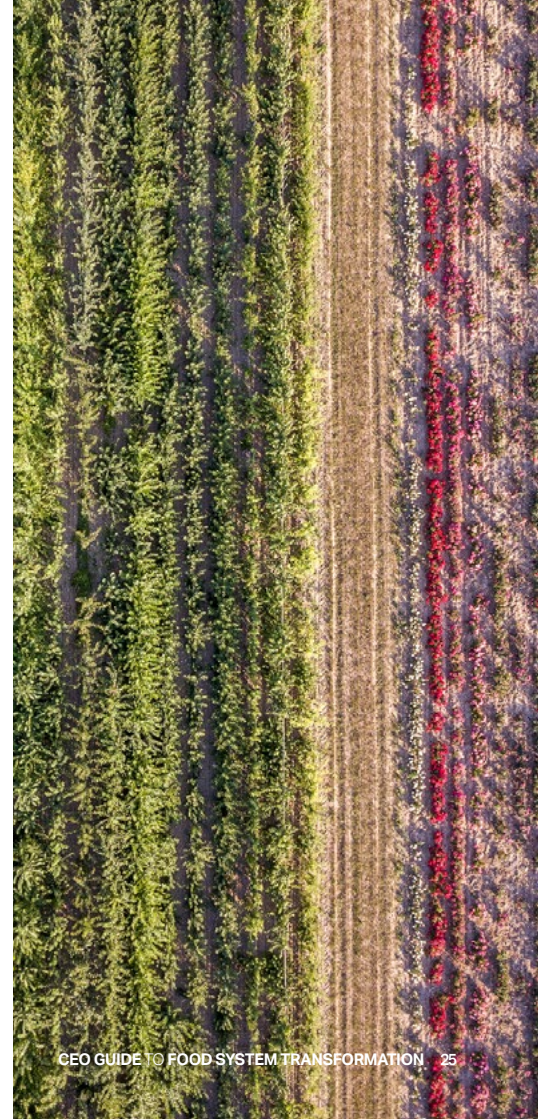


**Long-standing narratives need to be rethought. We need to innovate for new economic models that embed true cost accounting in businesses.**



**Ruth Richardson**

Executive Director, Global Alliance  
for the Future of Food



# ACTIONS FOR CEOs

Leaders will recognize which of the pathways are material to their business strategy.

Transforming any business will require several strategic shifts.

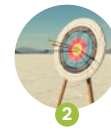
- **Set ambitious corporate goals** that aim to deliver on global frameworks
- **Transform supply chains**
- **Set business metrics** incorporating externalities in assessing performance
- **Engage and incentivize employees** across R&D and commercial teams to build solutions
- Ensure business strategy delivers **collective license to operate**
- Work **across value chains** to achieve **breakthrough solutions**
- **Shape consumer preferences** and lifestyles
- **Engage communities** in solutions that address poverty and build both capacity and resilience



1

**Understand your company's link to food system challenges**

and its role and aspirations in the seven transformational pathways



2

**Set robust targets**

which reflect the true financial value of externalities and which are science-based



3

**Develop and implement scalable solutions**

and new business models to achieve the targets

# ACTIONS FOR CEOs

Leadership beyond your own business is increasingly important.

Champions are needed to help other businesses, as well as governments, raise ambitions and take action.

- Work **across value chains** to achieve **breakthrough solutions**
- **Advocate for policy** and economic enablers
- **Lend your voice** at global conferences to build momentum
- **Set and align** standards on traceability, data collection and governance
- **Actively contribute** to accelerating work to transform food systems and create metrics to **value externalities**
- Rally your peers to **develop and implement** solutions to achieve these transformation pathways



# JOIN THE TRANSFORMATION

The WBCSD Food & Nature Program develops solutions to address key challenges and accelerate food system transformation.

## How WBCSD can support you

Join our [Food & Nature Program](#) and work with over 70 other forward-thinking businesses from across the value chain.

Together we are developing ambitious, science-based solutions that support business action at scale, across the seven transformation pathways.

**Lead.  
Transform.  
Succeed.**





# KEY WBCSD CONTACTS



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