

ALLIANCE STRATEGY
2026–2030

**Resilient Futures:
Urgent Science for Food and
Land Systems Transformation**



The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT) delivers research-based solutions that harness agricultural biodiversity and sustainably transform food and land systems to improve people's lives. Alliance solutions address the global crises of malnutrition, climate change, biodiversity loss, and environmental degradation.

Through novel partnerships, the Alliance generates evidence and co-creates innovations to transform food and land systems so that they sustain the planet, drive prosperity, and nourish people in a climate crisis.

The Alliance is part of CGIAR, a global research partnership for a food-secure future.

<https://alliancebioversityciat.org>

www.cgiar.org

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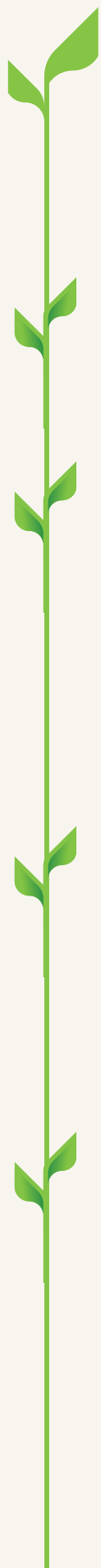
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Challenges, Science and Hope



Food and land systems, and the people who rely on them for nutrition, income, and identity, are under mounting strain. Climate change is accelerating, biodiversity is declining, and land degradation is advancing unchecked. Multiple forms of food insecurity persist alongside widening inequality. These forces are not moving in parallel. They are colliding, amplifying one another and pushing communities and ecosystems closer to their limits.

The consequences are already visible on plates and in lives. Poor diets are fueling malnutrition and diet-related diseases; 3 billion people still cannot afford a healthy diet.ⁱ At the same time, the livelihoods that depend on food and land systems are both vast and vulnerable: 3.83 billion people live in households linked to agriculture and food system-based work, yet in low- and middle-income countries, these households represent up to two-thirds of those living in extreme poverty.ⁱⁱ The global food economy is enormous, but too often it leaves the people who produce food in low- and middle-income countries with the least security.

Climate change sharpens every edge of these interconnected crises. Food and land systems are both a major source of greenhouse gas emissions (around 30% globally) and among the first to absorb the damage.ⁱⁱⁱ Each additional degree of warming further erodes the world's capacity to produce food, with projected losses of roughly 120 calories per person per day, if we continue prioritizing growing only a narrow range of cereal crops.^{iv} That is not an abstract statistic; it is a warning about stability, food security and nutrition, our current biodiversity myopia and the cost of living.

And yet, this story is not only one of compounding risks. The same interconnectedness that makes these challenges so hard to manage also reveals where the leverage lies. Food and land systems sit at the nexus of climate, biodiversity, health, economic opportunity, equality, and social stability. Urgent, science-driven change grounded in knowledge has the potential to deliver many benefits across this entire spectrum: healthier diets, more resilient livelihoods, restored ecosystems, reduced emissions, and stronger, more inclusive and diversified local economies. Done well, food and land systems transformation can reduce vulnerability to shocks and lay the foundations for shared prosperity for the farmers and communities at the heart of these systems over the long term, while remaining within planetary boundaries.



Resilient food and land systems are not a “nice to have.” They buffer extreme weather, protect water cycles, and store carbon—especially in healthy soils. They can help communities adapt to climate change and reduce emissions, which in turn, helps countries to meet their climate commitments. Stronger food and land systems can also reduce displacement and the risk of conflict by stabilizing equitable access to land, water, and income where tensions are rising. They are the foundations for prosperity and better diets.

The obstacles are real, but so is the momentum for change

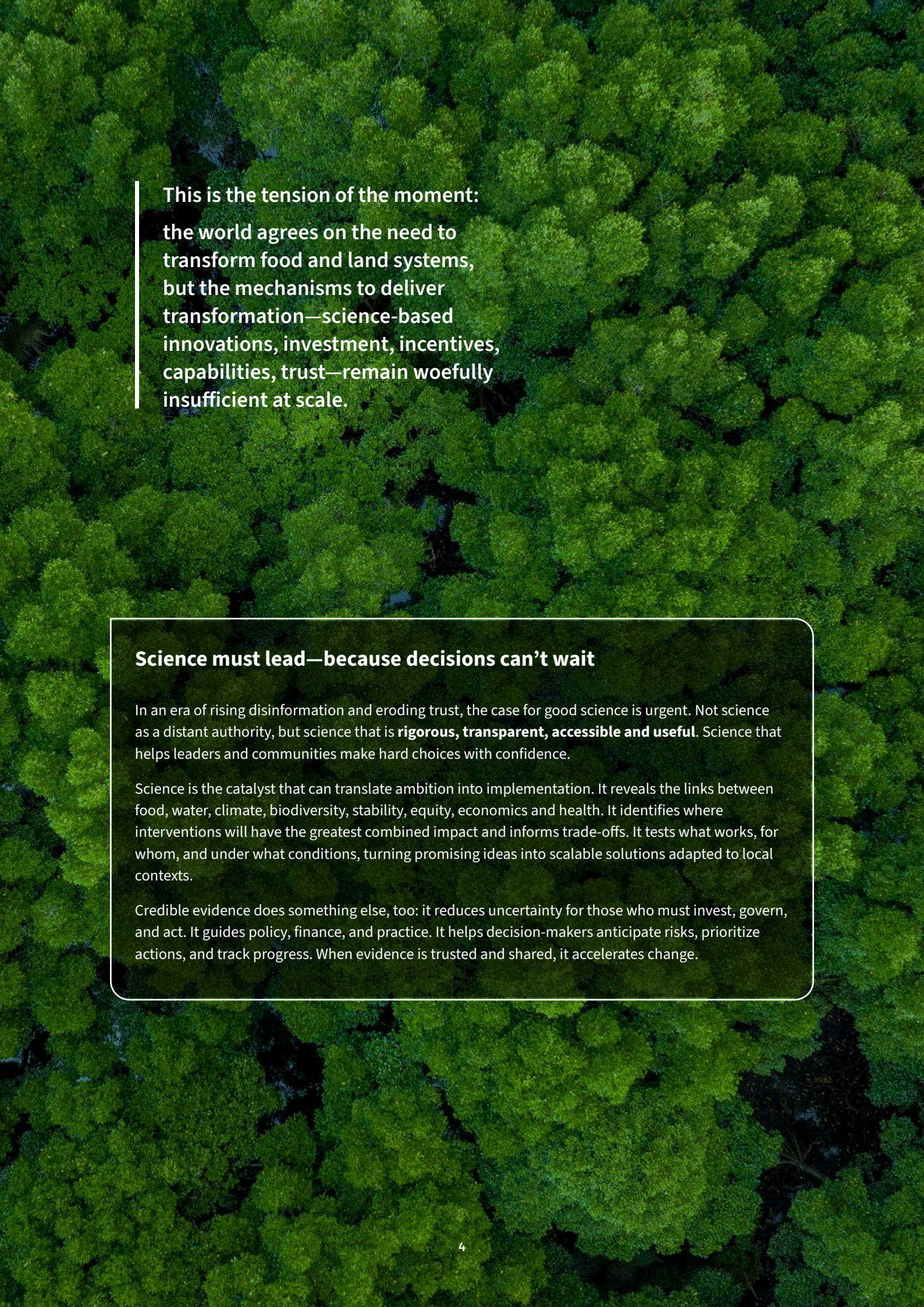
Momentum for transformation is growing, reflected in global frameworks and national plans: from the United Nations climate, biodiversity and desertification conventions to UN Food Systems Summit pathways and G7/G20 commitments. In 2023, 159 countries endorsed the COP28 Emirates Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action.^v By 2025, 128 countries had developed national food system transformation pathways, with 112 submitting voluntary progress reports.^{vi} The Global Biodiversity Framework adopted at the Convention on Biological Diversity’s global meeting in 2022 (COP15) has similarly spurred countries to set targets to meet their commitments.

Ambition on paper needs to be matched by change on the ground. Progress remains uneven, fragmented across sectors, siloed across institutions, and slowed by competing political and fiscal pressures. A growing frequency of crises—conflict, extreme weather, pollution and land degradation, health and food emergencies—strains public budgets and development finance. In many places, attention and resources are pulled toward urgent response measures and away from long-term investment in resilience. Shrinking aid budgets and geopolitical tension further tighten the space for sustained action.

Even where funding exists, it does not consistently flow toward transforming food and land systems to anticipate future needs, especially at local level. Many fiscal subsidies, such as national food security subsidies, still favor practices that undermine human and environmental health.^{vii}

The world needs around USD 700 billion per year to halt biodiversity loss,^{viii} yet current financing falls far short of what is required. Agriculture is at the center of the biodiversity crisis. On the one hand, roughly USD 542 billion per year in agricultural, fisheries, and forestry subsidies actively harm biodiversity, dwarfing what is spent to protect it.^{ix} The single biggest opportunity to close the gap is not creating new conservation funds but redirecting harmful agricultural subsidies toward nature-positive practices (including agroecological and regenerative approaches), which would simultaneously benefit biodiversity, climate, and food security.

Meanwhile, the regions and communities most exposed to climate impacts often receive the least support to adapt to them. In 2019–2020, less than 1% of global climate finance reached small-scale agriculture^x—among the systems most affected and most critical to building resilience and reducing emissions. Intensifying climate vulnerability is already driving displacement, with up to 216 million people projected to be internally displaced by 2050.^{xi}



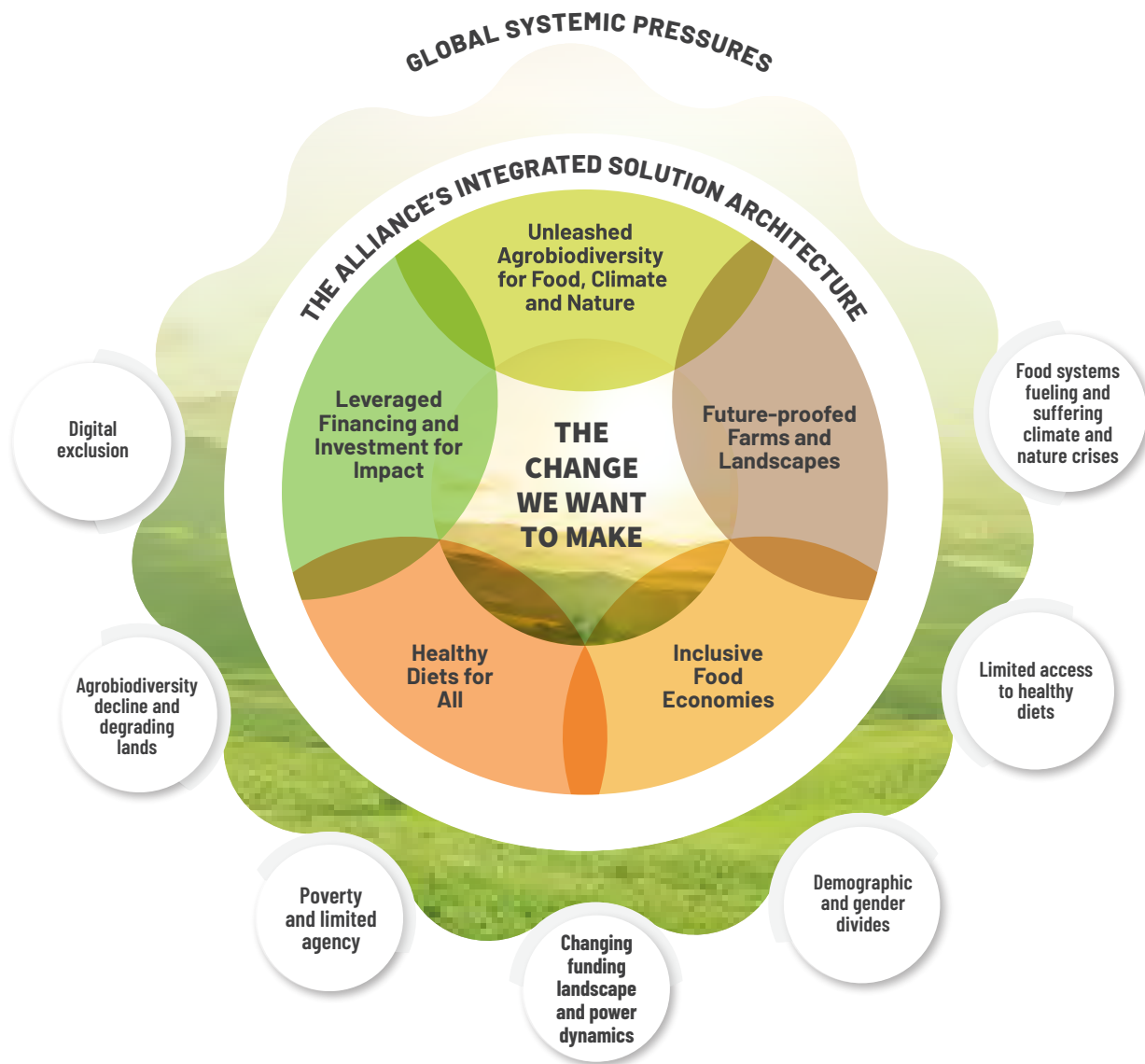
This is the tension of the moment:
the world agrees on the need to
transform food and land systems,
but the mechanisms to deliver
transformation—science-based
innovations, investment, incentives,
capabilities, trust—remain woefully
insufficient at scale.

Science must lead—because decisions can't wait

In an era of rising disinformation and eroding trust, the case for good science is urgent. Not science as a distant authority, but science that is **rigorous, transparent, accessible and useful**. Science that helps leaders and communities make hard choices with confidence.

Science is the catalyst that can translate ambition into implementation. It reveals the links between food, water, climate, biodiversity, stability, equity, economics and health. It identifies where interventions will have the greatest combined impact and informs trade-offs. It tests what works, for whom, and under what conditions, turning promising ideas into scalable solutions adapted to local contexts.

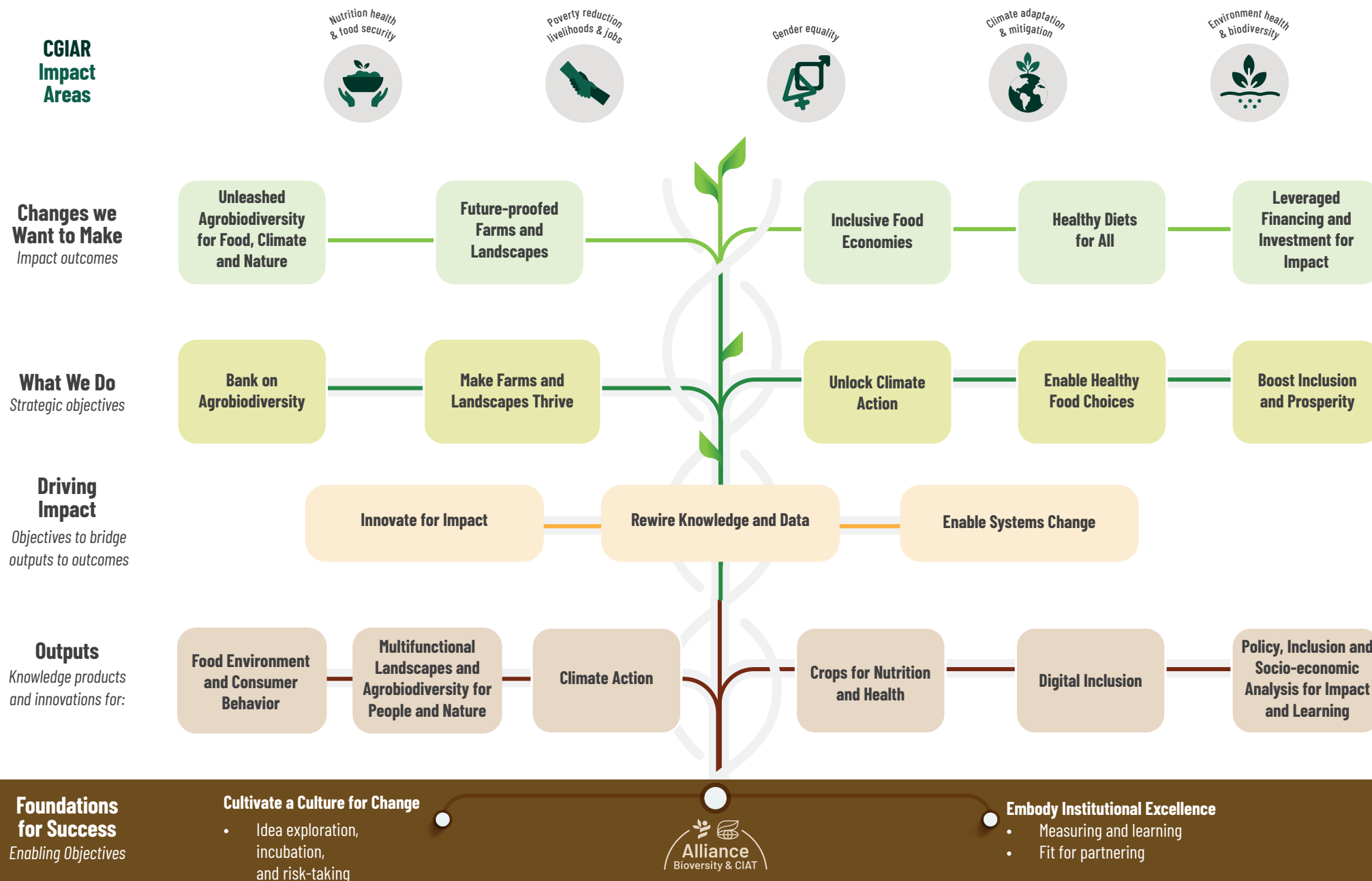
Credible evidence does something else, too: it reduces uncertainty for those who must invest, govern, and act. It guides policy, finance, and practice. It helps decision-makers anticipate risks, prioritize actions, and track progress. When evidence is trusted and shared, it accelerates change.



What do we mean by food and land systems transformation?

- ✓ **Food systems** refer to all the people, inputs, processes, infrastructures, institutions, environments and activities that relate to the production, processing, distribution, preparation and consumption of food (adapted from HLPE, 2014, p. 29).^{xii}
- ✓ **Land systems** encompass all processes and activities related to the human use of land (adapted from Verburg et al., 2015).^{xiii}
- ✓ **Food and land systems** include all the people, inputs, processes, infrastructures, institutions and activities related to how humans interact with land and the environment to produce, distribute and consume food.
- ✓ **Food and land systems transformation** refers to the **fundamental, systemic reconfiguration** of how landscapes are used, how food is produced and consumed, how markets and governance function, and how policy, finance and institutions are organized, to achieve sustainable, resilient and equitable outcomes for nutrition, livelihoods, ecosystem health and climate.

Our Theory of Change to tackle urgent crises in food and land systems



Urgency into Opportunity: The Alliance Way

The Alliance of Bioversity International and CIAT drives urgent science for food and land systems transformation.

We have a **vision** of food and land systems that sustain the planet, drive prosperity and nourish people. To achieve this, our **mission** is to deliver research-based solutions that harness agricultural biodiversity and sustainably transform food and land systems to improve people's lives in a climate crisis.

The Alliance plays a unique role as a *strategic connector and integrator* across science, practice and policy, linking agrobiodiversity, climate action, diets, markets and inclusive innovation to drive scalable, system-wide impact. We do not focus on just one agricultural sector. Our whole-of-system approach connects food and land systems—from production to consumption—ensuring that solutions address root causes rather than isolated symptoms.



Alliance impact

Putting innovation into farmers' hands

We are helping to contain devastating and emerging threats to crops and livelihoods, including **Cassava Witches' Broom** in Asia and Latin America and supporting **300,000+ African farmers overcome banana Xanthomonas wilt**.

We have delivered digital climate and crop advice to **810,000 farmers in Latin America**.

We have scaled precision fertilizer and climate advice services to **100,000+ farmers in Myanmar and Ethiopia**.

Developed **indicators to advance agroecology and regenerative farm-based agriculture** for the private sector.

Closed **knowledge gaps** on causes of crop contamination by heavy metals and **produced recommendations** to reduce risk.

Co-created **sustainable agricultural practices with communities in Kenya, Colombia and Peru** using scientific and local knowledge.

Establishing the roots of climate resilience

Scaled **50+ farmers' varieties to 3+ million farmers** in Ethiopia, delivering up to 60% yield gains.

Advanced improved native varieties of 20 crops, benefiting **75,000+ farmers in India**.

Led the **3rd International Agrobiodiversity Congress** (2025), convening global researchers and diverse stakeholders.

Developed the **Agrobiodiversity Index**, now used by **governments, companies and the Global Biodiversity Framework**.

Breeding at speed

Delivered improved crops for smallholders, including **iron- and zinc-rich beans**, and improved **low-methane cattle forages**.

Scaled an improved tropical cattle forage grass across **1.8 million hectares** in 70 countries, benefiting **1.6 million farmers**.

Together with farming communities in Latin America and the Caribbean, we tested and shared more than **100 zinc-biofortified rice varieties**.

Building on more than 50 years of scientific leadership, CIAT and Bioversity International came together to form the Alliance in 2019. Over the past six years, we have strengthened our combined expertise and geographical scope and updated how we work. This helps us stay agile, relevant and ready to respond to emerging challenges and opportunities.

By grounding research in diverse regional hubs and co-designing solutions with local partners, the Alliance ensures that innovations are context-specific, inclusive and highly adaptable. Our interdisciplinary methods, spanning digital tools, innovative finance, climate-smart agriculture, landscape approaches, agrobiodiversity and nutrition, accelerate transformation at multiple scales and deliver evidence for practical change. Together, these strengths enable the Alliance to catalyze transformative food and land systems that are resilient, equitable and beneficial for both people and the planet.

No single actor can solve the world's interconnected challenges alone. The Alliance is creating a new generation of innovation partnerships that connect public and private actors. By combining cutting-edge research with investment, market insights and entrepreneurial energy, we create stronger pathways to scale. These partnerships mobilize finance, improve access to technologies and markets and help local enterprises grow in inclusive and sustainable ways. And working closely with public institutions and private companies, we co-create solutions, strengthen capacity and build shared ownership. This collaboration builds trust, relevance and long-lasting impact.



Co-developed **AI-powered breeding tools**, including **Artemis**, to help breeders and farmers make better decisions.

Diversified diets for improved nutrition and livelihoods

Guided interventions that make healthy, sustainable food choices more accessible and appealing by mapping complex food environments (**rural to urban, informal to formal markets**).

Delivered nutrition outcomes at scale, integrating diverse Indigenous crops into school meal programs through local procurement and community initiatives, reaching over **2.7 million African children** with high-iron beans in 2024.

Shaped **national food-based dietary policies in countries, including Ethiopia and Vietnam**, promoting the benefits of diverse and nutritious diets.

Advanced understanding of food composition through the **Periodic Table of Food Initiative**, the **world's largest effort** to map the molecular “dark matter” of food, supporting better nutrition science and innovation.

Global policy influence

Helped shape **international agreements** that ensure **free access to plant genetic resources** for food and agriculture, building on decades of research and advocacy.

Played a key advisory role at **UN Biodiversity COP16 (2024)** on **digital sequence information (DSI)**, contributing to progress toward fair and equitable benefit-sharing arrangements.

Worked with the **Green Climate Fund** to inform investment in fragile and conflict-affected environments, contributed to the **UN Food Systems Summit**, and served as Secretariat for the **FABLE consortium**, supporting countries to plan sustainable food system futures.

Supported the development and implementation of **Vietnam's Food System Transformation National Action Plan**, translating global evidence into country action.

Our evolving research and innovation platforms support bold ideas—testing high-risk, high-reward solutions and helping the most promising ones move quickly from pilots to real-world impact. Digital tools, data science, multidisciplinary work, modelling and geospatial analysis make our work faster, smarter, wider-reaching and more transparent.

Over the next five years, we will accelerate and amplify our work as an engine for science and partnerships to meet fast-evolving decision-maker needs for the public good. We will focus on impact at scale while ensuring that our solutions are grounded in the diverse, local realities of farmers, markets and consumers.

The Alliance's role is not only to understand the crises but to help change their trajectory. The next five years will determine whether food and land systems become a multiplying force for fragility, or a foundation for resilience and renewal. The pressure is rising. But so is the possibility: to build systems that nourish people, support dignified and equitable livelihoods, restore nature and help stabilize the climate.

Our focus is clear. With good science co-developed with and for partners, we can turn today's converging challenges into a once-in-a-generation opportunity for sustainable and inclusive development.

Excelling from the Inside Out

Strong science depends on strong institutions. We aim for excellence in everything we do—working with agility, accountability and a commitment to continuous improvement. We measure our success with the same rigor we measure the outputs and impact of our science.



Our core values



Curiosity

We are open-minded, eager to learn and committed to growing.



Entrepreneurship

We adapt quickly and tackle complex problems with creativity.



Empowerment

We create the space for people to thrive, succeed and reach their full potential.

How we make our science thrive

Fit for partnering

Strong partnerships are at the core of the Alliance's work. Strategic partnerships extend our reach and impact by combining complementary strengths, knowledge and influence to address complex challenges more effectively than any one actor alone. Active, sustained engagement builds trust, aligns priorities and ensures joint ownership of outcomes across countries, sectors and scales.

A broader funding base helps sustain partnerships across regions and over time. Partnerships with public, private and philanthropic investors provide both flexibility and stability in pursuing shared goals. Through innovative finance, grounded in scientific evidence, we help align investment with sustainability outcomes and connect funding strategies to national, regional, and global priorities. Sound operational and financial systems guide investment and policy choices in support of long-term change. Shared approaches to accountability, monitoring and investment enable partners to plan with confidence and act together.

Strengthening capacity

Our capacity development work includes joint research, mentoring early-career scientists, targeted training, digital learning and participatory approaches, such as farmer field schools and innovation networks. By prioritizing gender equality, youth engagement and South-South exchange, we help build more inclusive and resilient food systems that continue to evolve beyond individual projects.

Internally, we focus on improving how we work together—strengthening communication, knowledge-sharing and collaboration across teams and disciplines. Recruitment and training adapt to emerging skills needs, bringing diverse perspectives to complex challenges. Together, these efforts foster shared purpose, co-ownership and collective accountability across the Alliance.



Measuring and learning

Measurement and learning are embedded in how the Alliance works. Ongoing tracking and evaluation inform strategic decisions and help ensure our research delivers real outcomes. Transparent monitoring supports adaptive management and accountability to partners, while foresight and scenario planning help us anticipate risks and opportunities. Our approach aligns with CGIAR's performance and results framework and contributes to system-wide improvements in monitoring, evaluation, learning, impact assessment and foresight.

Innovation and risk-taking

Innovation requires taking risks, but many traditional funders prioritize low-risk investments and guaranteed returns, which can limit real innovation. To address this, we use internal mechanisms that move us beyond project-by-project delivery toward a continuous cycle of foresight, thought leadership and strategic positioning.

Our “sandbox” model creates space for early experimentation, allowing ideas to be tested, adapted, and improved through rapid learning from both success and failure. This approach accelerates promising concepts and helps us respond quickly to feedback across different contexts. We turn science outcomes into commercialization pathways, bringing what we can prove works to markets that need it. By staying agile, we are better able to anticipate emerging priorities in food systems and highlight where new ideas, investments, policies or capacities are needed in partner countries.

Engaging in policy

Science achieves impact when evidence informs real-world action. Strong, strategic, advocacy-led communications capacity is essential to translate complex scientific insights into clear, relevant and actionable recommendations for decision makers.

Through sustained policy engagement, built on long-term stewardship of local-to-global knowledge and policy communities, we help bridge the gap between research and practice. By connecting researchers, practitioners and decision makers, we ensure that evidence is timely, trusted and usable—guiding investment choices and shaping national, regional and global agendas toward more effective and sustainable outcomes.



Digital transformation and knowledge for impact

We are strengthening our data and digital ecosystem to support innovation, efficient operations and better decision-making across research and delivery, keeping our 2,000+ staff connected across regions and able to work more collaboratively. We manage data close to its source, enable interoperability across platforms and apply shared standards that make information easier to access and use.

By connecting digital efforts across teams and raising data and software standards, we are building leadership in digital innovation and positioning the Alliance as a reference point for digital transformation in food and land systems. Training, peer learning and spaces for experimentation are building digital confidence and helping staff apply emerging tools, including AI, in practical ways that improve performance, collaboration and insight.

Unlocking knowledge for impact

Digital transformation helps us turn knowledge—ranging from scientific analysis to lived experience—into timely, practical insights for addressing real-world challenges. Interoperable data, responsible AI, and approaches such as voice-based data collection in local languages, broaden access to information and make evidence more useful for farmers, practitioners and policymakers.

The Alliance promotes open and ethical knowledge systems by bringing together scientific, local and Indigenous knowledge, and governing data according to the FAIR principles (Findable, Accessible, Interoperable and Reusable) and CARE principles (Collective Benefit, Authority to Control, Responsibility and Ethics). This helps ensure that knowledge remains accessible, reusable, trusted and ethically managed.

Integrating sustainability

We integrate sustainability across procurement, resource use and environmental management to reduce our carbon footprint, advance circular resource use, and strengthen institutional accountability.



Our partner network

- ✓ **National governments.** Through our work with ministries, research institutions, extension and advisory services, we align our research with country needs and foster innovation in key priority areas.
- ✓ **The private sector and social enterprises.** Our partnerships with business innovators allow us to co-develop solutions that are profitable, sustainable, market-relevant and aligned with the Sustainable Development Goals (SDGs).
- ✓ **International, regional financial institutions and banks.** We promote new partnerships with financial institutions to position the Alliance as a knowledge broker and operational partner to jointly mobilize sustainable investments.
- ✓ **Funders and philanthropies:** We work closely with funding partners to co-design and scale initiatives around common goals, ensuring that investments translate into measurable impact and sustainable development outcomes.
- ✓ **Civil society.** Spanning development organizations, local non-governmental organizations, farmers' associations, Indigenous Peoples organizations and women's groups, we spearhead partnerships to co-create evidence-based, innovative solutions to enhance agriculture, empowering farmers and rural communities.
- ✓ **Academia.** Through a two-way approach, we both integrate our knowledge products into curricula and tap into research capacities to produce cutting-edge science.
- ✓ **UN Agencies.** Through long-term partnerships with the UN, we inform global-to-local policy based on research findings.
- ✓ **CGIAR.** As part of CGIAR, a global research partnership for a food-secure future, we work closely with other CGIAR Centers and partners to drive collaborative science and innovation efforts.

A photograph of two men in traditional Ethiopian white clothing (netela and netela) and white headwraps (netela). They are standing in a field of tall, golden-brown grass. The man on the left is looking down at a plant sample, while the man on the right is holding a small green object, possibly a seedling or a tool, and looking at it. The background is a soft-focus field of similar grass. The text is overlaid on the upper right portion of the image.

Our work has a strong legacy of safeguarding crop diversity. We do this through initiatives that range from community seedbanks to international genebank collections of bananas, beans, cassava, and forages. Using participatory varietal selection and crowdsourcing, the *Seeds for Needs* initiative has evaluated, selected and disseminated existing farmer varieties to strengthen resilience, and improve food and nutrition security, while reducing reliance on agrochemicals. In Ethiopia, we distributed over 50 locally adapted crop varieties to over three million farmers, spanning **over 1.5 million hectares, with 20–60% productivity increases**. Recently, we have focused on using agrobiodiversity to advance agroecological practices that replenish soil health and restore degraded land with native trees. **Over 75,000 Indian farmers now benefit from cultivating improved native varieties** of 20 crops. In 2025, we hosted the third International Agrobiodiversity Congress, bringing together researchers and diverse stakeholders worldwide. Our Agrobiodiversity Index, which measures the status of agrobiodiversity in food and land systems, has been adopted by governments, companies, and as an indicator in the Global Biodiversity Framework.

Increased agrobiodiversity and agroecology



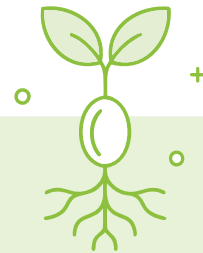
OUTCOME 1

Unleashed Agrobiodiversity for Climate, Food and Nature

The food and land systems challenge

Agrobiodiversity, encompassing the diversity of crops, trees, livestock and aquatic species, the genetic variation within them, and the broader web of pollinators, soil organisms and ecological interactions that sustain agricultural systems, is the foundation of resilient food and land systems. Like diversity in an investment portfolio, it reduces risk and increases resilience to shocks, while boosting productivity, nutrition and climate adaptation over the long term.

Modern agriculture and food systems rest on a dangerously narrow genetic base, leaving them acutely vulnerable to pests, diseases, and climate and socioeconomic shocks. Yet, the solution is already within reach. The vast reservoir of genetic diversity held in genebanks, farmer fields and landscapes worldwide remains one of the most powerful and chronically underutilized tools available, offering proven pathways to stronger crop and livestock systems, enhanced ecosystem services and greater choice for farmers and consumers. At a moment when the window to act is narrowing, failing to mobilize this diversity at scale is a risk we can no longer afford.



Located in Palmira, Colombia, *Future Seeds* is a state-of-the-art genebank and global innovation hub that conserves the world's largest collections of beans, cassava and tropical forages, safeguarding more than 67,000 crop samples for humanity. By connecting conservation, cutting-edge science and global collaboration, *Future Seeds* supports climate resilience, food and nutrition security, and the sustainable transformation of food and land systems.





What success looks like

Genebanks, breeding programs, farming communities and public and private seed sectors work together to safeguard, improve and deploy agrobiodiversity at scale, where the genetic wealth held in collections and farmer fields is actively translated into sustainable, nutritious food options, and where the value of this diversity is well understood and rewarded so that its conservation and use become self-reinforcing, driven by both public commitment and market demand.



Our approach

We conserve, study and improve crops, their wild relatives, and the full spectrum of agrobiodiversity, linking conservation directly to real-world use. Through global genebank collections, advanced genomics and biotechnology, and direct collaboration with international and national research organizations, farmers and communities, we bring agrobiodiversity into production systems, markets and diets, strengthening resilience, nutrition and prosperity across entire food chains.

We work with farming communities worldwide to identify and scale high-potential opportunity crops, particularly underused legumes, vegetables and fruits adapted to local climates and cultures, turning neglected diversity into engines for resilience, healthy diets, and inclusive economic opportunities. Our gene editing, trait discovery, and breeding programs simultaneously drive improvements in globally critical crops, including banana, cassava, rice, common beans and tropical forages, while building the capacity of national research and breeding systems to adapt, own and sustain these advances over the long term.

From soil microbes and locally important varieties to major staple crops, wild relatives and whole landscape ecosystems, we work across the full continuum of agrobiodiversity, ensuring that no level of biological diversity is left out of the transition to resilient and sustainable food systems.

Generating and applying evidence

We **manage the world's collections of forages, beans, cassava, and banana**—crops that millions of people depend on for food security and livelihoods. Our **genebanks in Colombia and Belgium** serve as living platforms for conservation, outreach, capacity development and innovation, connecting farmers and scientists with the genetic resources needed to drive climate-resilient production. We also develop **next-generation conservation tools**, including cryopreservation and tissue culture protocols for crops, such as banana, cassava and fruit trees, that cannot be stored as seeds, ensuring these irreplaceable resources are safeguarded for future generations.

Working with **National Agricultural Research and Extension Systems (NARES)** and public and private partners, we use this genetic diversity to **accelerate demand-led breeding**. We combine genomics, **advanced breeding techniques**, AI, and crop modeling to identify and deploy the traits farmers need most, including heat and drought tolerance, pest and disease resistance, enhanced soil carbon sequestration and improved **nutrition**, such as iron-rich beans and vitamin A-rich banana varieties developed for communities facing micronutrient deficiencies.

To move agrobiodiversity from genebanks into farms, markets and diets, we use **digital tools** that link collections directly to users and create real-time feedback loops between conservation and use. All germplasm and data are **shared openly** through international frameworks, ensuring fair and equitable access to resources that drive global innovation.

Soil biodiversity is as critical as the diversity of crops above ground. Through the Common Microbial Biotechnology Platform in Vietnam, we study how soil microorganisms interact with crops and ecosystems, helping farmers reduce dependence on mineral fertilizers and pesticides.

Strengthening capacity, inclusion and collaboration

Alongside genebank and research work, we support communities to map, manage and use the diversity in their fields and landscapes. We partner with local knowledge holders to ensure that people who have protected crop diversity for generations benefit from its use. Our **Seeds for Needs** approach bridges genebank collections and farming communities, matching varieties from global and national collections to specific agro-ecological and social contexts, creating a continuous feedback loop between conservation and use.

Through participatory approaches, we design innovations that reflect the different needs of women and men. Women often prioritize traits, such as taste, cooking time and processing ease; men often focus on yield and marketability. We use gender-responsive market research to ensure breeding and delivery systems are socially and economically viable.

Our **on-farm trials**, developed in collaboration with local partners and community members, generate real-world evidence on agrobiodiversity adapted to diverse local contexts. Central to this is **TRICOT**, our **pioneering approach that turns farmers from beneficiaries into active experimenters**, running thousands of micro-trials using simple rankings rather than complex measurements. Supported by our **ClimMob digital platform**, TRICOT has been adopted across and beyond CGIAR, helping identify the varieties farmers need most, from farmer-bred varieties ready for use today to those requiring further improvement.



We also **work with locally important, often globally neglected opportunity crops** that are well adapted to climate extremes. Through a strategic partnership with the Crop Trust, we are working across nine countries to strengthen the conservation, production and consumption of 27 opportunity crops with exceptional nutritional and climate resilience potential, including fonio, amaranth, baobab and turkey berry. In India, this work builds on nearly two decades of sustained engagement, including a landmark project implemented jointly with the Indian Council of Agricultural Research across four agro-ecoregions, mainstreaming the conservation and use of 20 traditionally important crops and strengthening local seed systems, institutional frameworks and community livelihoods. Investment in neglected diversity is one of the most powerful and underleveraged pathways to building resilient, nutritious and inclusive food systems.

Community seedbanks



Lilian Aluso at the genebank in Vihiga, Kenya.

In Kenya and Uganda, Alliance-supported community seedbanks conserve 72 crop and tree species and more than 600 varieties, providing over 10,000 farming households with sustained access to diverse and nutritious foods. They also demonstrate how community seedbanks can serve both as conservation tools and viable local enterprises. In India, 19 community seedbanks steward more than 2,000 traditional varieties across 20 crops. More than 8,000 farmers have participated in capacity-building programs, and at least 300 promising native varieties have been identified for their climate resilience, nutritional value and livelihood potential.

Through decentralized seed systems, including community seedbanks, we help farmers improve the quality and variety of the planting materials they produce and distribute. Embedded within local seed enterprises and farmer networks, community seedbanks create a direct and lasting link between agrobiodiversity conservation and rural livelihoods. This model strengthens local capacity, creates job opportunities—including for women and young people—and reinforces public-private partnerships.

In fragile and conflict-affected settings, we work with communities to restore access to diverse, locally adapted seeds, helping food systems recover after shocks and supporting livelihood recovery that is essential to stabilization and long-term resilience.



Shaping policy and decision-making to drive systemic change

We work with governments, regional bodies and the private sector to **embed agrobiodiversity into food, climate and development policies**. Through strong evidence and clear policy guidance for global, regional, national and local decision-makers, we help create enabling environments that incentivize the conservation and sustainable use of diversity. We support governments in navigating and aligning the different genetic resource governance frameworks developed across sectors, including the Convention on Biological Diversity for the environment and the International Treaty on Plant Genetic Resources for Food and Agriculture for agrobiodiversity and food security.

This includes aligning seed regulations with local realities, integrating crop diversity into national climate, biodiversity, economic development and nutrition plans, and guiding investments that expand inclusive and diverse seed and market systems.

Our **demand-led approach** targets specific market segments, bringing together the needs of farmers, market actors and consumers. By linking breeding, markets and consumer awareness, we help ensure that nutritious, climate-resilient crops reach farms and households.

Our data aggregation and visualization tools—such as the **Gender-Responsive Seed Index**, the **Agrobiodiversity Index**, and **participatory on-farm trial approaches (Tricot and ClimMob)**—fill critical data gaps and help guide smarter investments and policies.

Our scientists contribute directly to major global assessments, including those led by the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)**, and advise the **Rio Conventions** through expert groups under the **Convention on Biological Diversity**. We bring evidence into international negotiations and help shape policies that protect biodiversity and strengthen food systems.

Looking ahead: high-impact transformations

1 Agrobiodiversity for climate resilience

We will invest in the conservation and use of diverse crops and forages to build climate-resilient farming systems, improve nutrition and reduce risk for smallholder farmers. Our work will advance agrobiodiversity solutions that support climate adaptation, sustainability and healthier diets through greater genetic and agroecosystem diversity.

2 Turning neglected crops into drivers of nutrition and climate resilience

The Alliance will identify crops with untapped potential and create opportunities to scale them across food systems. We will close critical intelligence gaps by combining genomics and AI to identify the agrobiodiversity assets best suited to deliver nutrition, resilience, sustainability and inclusion for future generations.

We will accelerate the deployment of drought-tolerant, nutrient-rich and pest-resistant crops by combining genomics, AI and participatory breeding at greater scale, working with national systems to ensure these innovations reach the farmers and communities that need them most. Through inclusive seed systems and climate-smart production bundles, we will help move these innovations beyond pilot stages into market-ready solutions that strengthen soil health, landscape resilience and nutritional quality.

We will also scale opportunity crops as high-value assets, leveraging their nutritional density and resilience to climate extremes to diversify markets and challenge dependence on mainstream commodities. In parallel, we will advance the use of soil biodiversity—an untapped frontier for carbon sequestration, soil health and productivity.



Digitally supported farmers and communities empowered to improve farming practices

Digital innovations range from agro-climate bulletins that guide local planting and harvesting under climate change, to innovations such as the Tumaini mobile application for banana pest and disease monitoring, which enables farm health surveys and recommendation sharing. The Alliance has worked closely with public and private sector partners, to bring science-based advice directly to those who need it, for example, **reaching 810,000 farmers with climate-resilient solutions** across three Latin-American countries; validating and scaling **site-specific fertilizer recommendations to over 72,000 farmers in Ethiopia** via digital advisory, and delivering climate advisory to **26,064 crop and fish farmers** in Myanmar.

Future-Proofed Farms and Landscapes

The food and land systems challenge

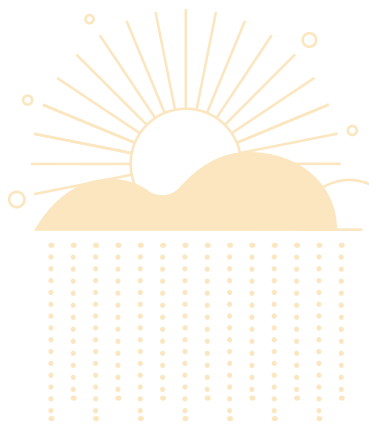


Climate change, land degradation, biodiversity loss, and poor soil health are undermining the ecosystems that sustain food, nutrition and livelihoods. For decades, food production, ecosystem health and rural livelihoods have been treated as competing priorities, with agricultural intensification pursued at the expense of nature, and conservation framed as a barrier to development rather than its foundation. Biodiversity has been systematically sidelined in favor of input-dependent monocultures, driven by commercial incentives and reinforced by misaligned subsidies and policies. This fragmented approach to managing landscapes and food systems has accelerated environmental degradation while failing to deliver food security, nutrition or resilience for the communities most affected.

As soils erode and ecosystems decline, competition over natural resources intensifies, resilience weakens, emissions rise and the risks of livelihood collapse and conflict grow. The prevailing model, which—built on chemical inputs, monocultures and the exclusion of biodiversity—is increasingly unsustainable. What is needed is a fundamentally different approach that places nature and biodiversity at the center, not as constraints on productivity, but as essential enablers of resilient and sustainable food systems.

Restoring agricultural landscapes through the enhanced use of biodiversity can help reverse these trends by rebuilding ecosystems, strengthening climate resilience, reducing emissions and expanding inclusive market opportunities across diverse crops.





What success looks like

Farmers, communities and their supporting institutions and organizations collaboratively innovate to transform farms and landscapes into equitable, climate-resilient and environmentally friendly systems that provide diverse, nutritious food, income and ecosystem benefits.

Our approach

We work directly with governments, farmers, communities, market actors and local institutions to **transform farms and landscapes** into biodiverse, low-emission and climate-resilient systems. These systems strengthen resilience to **climate change** while reducing emissions, generating social, economic and environmental benefits, and supporting healthy, safe and diverse diets.

Together with local partners, we **co-design and test on-farm innovation packages** that regenerate soils, strengthen climate resilience, reduce greenhouse gas emissions and sustain crop diversity across both staple and high-value opportunity crops. These innovations diversify diets, farming systems and markets, strengthen food and nutrition security, and create new income opportunities in both stable and fragile contexts. **We also look beyond the farm to the wider landscape**, examining, for example, how agroforestry systems can reduce emissions and soil erosion, improve water quality and attract wild species that naturally control crop pests, reducing the need for pesticides.

We also help countries and communities **close the climate finance gap**. Through evidence generation, de-risking mechanisms and investment tools, we help unlock public, private and philanthropic funding to support **agroecological transitions and resilient, low-emission development pathways rooted in people, climate and nature**. In parallel, we support and incentivize farm and landscape managers to adopt regenerative and climate-resilient practices that restore ecosystems, sustain healthy diets and drive rural entrepreneurship and job creation.

Generating and applying evidence

Our climate research delivers solutions that demonstrate how agrobiodiversity can improve soil health, increase carbon storage and support low-emission livestock systems. In Colombia, for example, we introduced an improved tropical forage variety for cattle that **can reduce methane emissions by 20–35% or more** while maintaining high digestibility and yield potential.

We study how regenerative and agroecological practices **rebuild soils and improve water retention**, laying the foundation for sustainable food production. By integrating diverse crops, trees and livestock, we work with communities to restore fertility and productivity to degraded land. We expand access to high-quality seeds and support the recovery of native species so restored landscapes remain productive and biodiverse.

We also promote **circular approaches**, such as recycling organic waste into fertilizers, feed and energy, reducing emissions while creating new business opportunities.

Our work includes developing **incentives and safety nets** that make sustainable land management economically viable and rewarding. Insurance schemes and payment-for-ecosystem services programs encourage farmers for good stewardship practices. We deliver last-mile climate risk intelligence to **millions of farms and enterprises**, transforming climate risk from a barrier into an opportunity for informed decision-making. We modernize climate risk translation and decision-support systems, strengthen last-mile delivery mechanisms and align policy with local action, helping producers and agribusinesses manage climate, market and price shocks. Our climate risk management and agronomic advisory services benefit more than half a million farmers every year across Vietnam, Colombia, Guatemala, Kenya, Ethiopia and Senegal.

When linked to **nutrition programs, school feeding initiatives and public procurement systems**, these tools can **increase demand** for a wider range of nutrient-rich foods—creating a positive cycle in which healthy landscapes support more resilient markets, stronger local economies and diverse, healthy diets.

Connecting science, traditional knowledge and stewardship



Inauguration of the community seed bank in Cumbal, Colombia.

The Alliance collaborates with Indigenous Peoples and local communities across diverse landscapes to support the conservation and sustainable use of agrobiodiversity. Through respectful partnerships and co-creation processes, these collaborations help strengthen resilience, food security, cultural knowledge and locally grounded approaches to food and land systems transformation.

Strengthening capacity, inclusion and collaboration

To scale restoration, we work with local partners and communities **to build strong native seed systems**, strengthen community leadership and support policies that encourage local entrepreneurship. When seed markets are inclusive and the right incentives are in place, restoration becomes both environmentally effective and economically viable.

Landscape-level transformation requires an **integrated approach**. We help partners connect on-farm practices with broader landscape management efforts to protect soils, conserve biodiversity and increase productivity. In fragile regions, we support **community-led restoration initiatives** that reduce pressure on scarce resources while strengthening social cohesion. This work shows how restoring ecosystems can also rebuild trust and stability.

For example, in Cameroon, the Alliance leads a community-based restoration approach that enables smallholders and local nurseries to plan, monitor and receive incentives for tree restoration through transparent digital tools, such as **MyFarmTrees**. This helps create more stable, locally owned and economically viable land management systems.

To do this, we promote a suite of proven biodiversity-based practices:

- mixed farming systems
- agroforestry and silvopastoral systems
- diversified cropping systems with soil conservation practices
- protection and restoration of natural ecosystems

We work with local and national governments to **shape incentives and policies** that encourage conservation and sustainable land use. Women are central to successful transformation. Although women make up 43% of the agricultural workforce, they own less than 20% of land. We help partners **strengthen women's land rights** through gender-transformative approaches that challenge discriminatory norms in customary tenure systems, as well as through group-based tenure models that support women as active leaders of restoration efforts.

We strengthen the reach of climate-smart innovations to farmers through **improved last-mile delivery systems** and **more inclusive business models**. We also help ensure that women and young people can access and use climate information, resilient inputs and financial services. Digital climate advisories provide **real-time, locally relevant guidance** on what and when to plant.

Through public-private partnerships, we support the integration of climate intelligence into the growing ecosystem of agri-tech startups, AI-enabled advisory tools and last-mile delivery platforms to help scale solutions that sustain livelihoods and promote nutritious, diverse foods.



Shaping policy and decision-making to drive systemic change

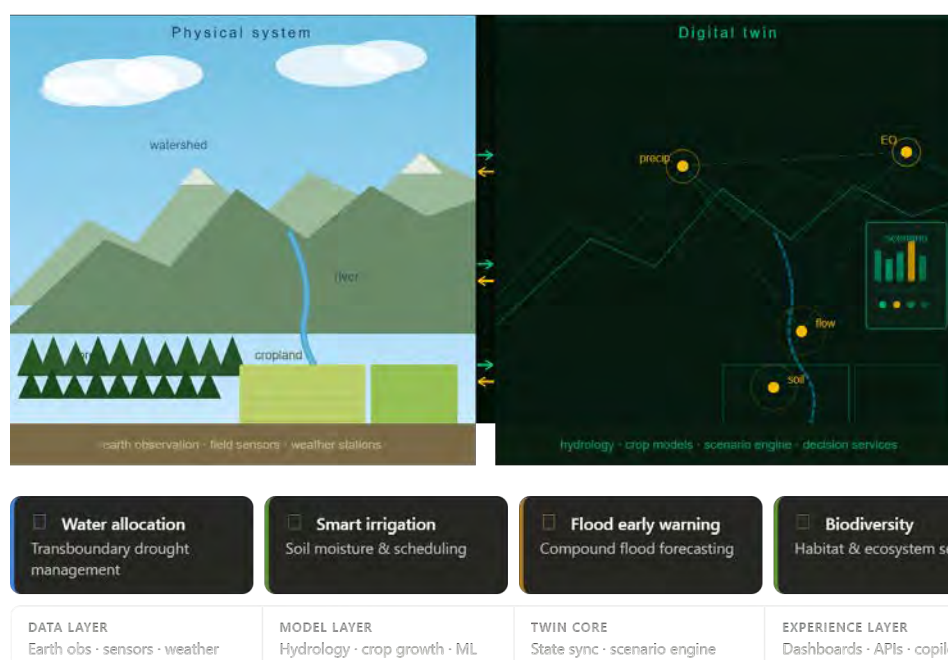
We work with governments, regional organizations, NGOs and private sector partners to **embed resilience and restoration** into national food, climate and biodiversity strategies. We support countries participating in global processes, such as the **United Nations Framework Convention on Climate Change (UNFCCC)**, helping them align action plans, strengthen monitoring systems and design financing mechanisms for system-wide transformation grounded in robust scientific evidence.

Our scientists contribute directly to major global assessments, including as **lead authors for reports of the Intergovernmental Panel on Climate Change (IPCC)**, and as **experts in UNFCCC working groups**.

We develop **decision-support tools**—such as **Digital Landscape Twins** and the **Africa Adaptation Atlas**—that translate complex data into clear, actionable guidance for planners and policymakers.

Digital Landscape Twins

DIGITAL TWIN · MULTIFUNCTIONAL LANDSCAPES



Azzarri & Orjuela-Ramirez, CGIAR 2025

Virtual landscape models simulate real-world scenarios, helping planners test interventions, compare trade-offs and design solutions that balance productivity, biodiversity and equity.

The Alliance also works to close **the climate finance gap** for food and land systems transformation. While annual financing needs in emerging economies reach USD 222 billion, global flows totaled only USD 65 billion in 2023—leaving an annual shortfall of USD 157 billion. We help build stronger links between climate finance and food systems by mobilizing adaptation investment, stabilizing food supplies, attracting private capital, and supporting countries in delivering their national climate commitments.

But better policies alone are not enough. The food systems degrading landscapes and undermining resilience were shaped by deliberate economic choices, and they will only transform when the economic incentives that sustain them change as well. Nearly USD 542 billion per year in agricultural subsidies continues to reward practices that harm biodiversity, degrade soils and drive emissions.

We work with governments and international partners—including through the Convention on Biological Diversity and the United Nations Food Systems Summits—to redirect these harmful incentives toward nature-positive, climate-resilient practices. We also support the development of true-cost accounting frameworks that make the environmental and health costs of industrial food systems more visible to decision-makers, investors, and consumers.

Trade and regulatory mechanisms, such as the European Union Deforestation Regulation, demonstrate how well-designed policy can shift supply chain behavior at scale. We provide the evidence and tools needed to apply these approaches more broadly to biodiversity and soil health.

We also conduct research to develop tools for the **rigorous measurement, reporting and verification** of emissions and land-use change, including deforestation linked to agriculture. These tools strengthen accountability and help countries and global partners track progress toward climate commitments.

Looking forward: high-impact transformations

AI-powered digital agriculture for smallholders

We will scale AI-powered tools, mobile platforms and remote-sensing technologies to provide millions of farmers with real-time, localized advice that improves productivity, input efficiency and climate resilience. These tools help bridge the digital divide by delivering actionable insights that strengthen yields, resilience and decision-making.

Making food systems drivers of peace and stability

CGIAR works in 32 of the world's 39 fragile and conflict-afflicted settings, yet only around 5% of activities explicitly consider conflict dynamics. Drawing on expertise across the social and natural sciences, we help decode the Climate-Security-Food nexus and make conflict-sensitive innovation operational in fragile contexts. We promote peace-positive approaches across food, land and water solutions, helping ensure that climate innovations—from seeds and irrigation to agroforestry and advisory services—can endure and scale in contested environments.

Nature-positive low-emission food systems

We will help transform agricultural landscapes through regenerative practices, agroecology and ecosystem restoration that deliver multiple benefits. Our approach aims to reverse biodiversity loss, support sustainable and resilient productivity growth, and strengthen ecosystem services, including climate change mitigation. Aligning agriculture with biodiversity and climate goals can restore ecosystems while sustaining food production.

A woman wearing a wide-brimmed hat and a light-colored button-down shirt stands in a field of green crops. She is holding a wooden frame that supports a digital tablet. A white line connects the tablet to the main title text on the right. The background is a warm, golden-yellow sky over a field of crops.

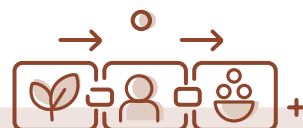
Applied digital innovations for accelerating crop breeding to meet smallholder farmers' needs

In partnership with national research institutes and extension programs, we have helped farmers access and cultivate iron- and zinc-biofortified beans, drought-resistant rice and low-methane forages for more sustainable livestock systems. **Today, over 1.8 million hectares in 70 countries are planted with *Urochloa* hybrid forage seeds, benefiting 1.6 million farmers** through improved cattle productivity, farm income and food security. In Latin America and the Caribbean, more than **100 high-zinc biofortified rice lines**—combining improved nutrition, climate resilience and blast resistance—have been distributed and tested with local communities, particularly women and Afro-descendant farmers. Citizen science approaches have supported the successful adoption of these varieties. We have also co-developed AI platforms that accelerate resilient breeding efforts. A notable example is **Artemis, an innovative phenotyping approach** that combines digital imagery with large language models to help breeders identify improved crop traits more efficiently. These tools are designed collaboratively with end users to address real challenges faced by breeders and farmers, enabling better informed field-level decision-making.

OUTCOME 3

Inclusive Food Economies

The food and land systems challenge



Across much of the world, food economies remain unequal and disconnected. Informal markets dominate, while many farmers, traders, processors and consumers—especially women and young people—lack the finance, infrastructure, networks, agency and knowledge needed to contribute effectively to food systems transformation. These barriers limit innovation, constrain entrepreneurship and prevent nutritious diets from reaching the people who need them. They are not accidental gaps, but the result of food economies shaped around the interests of large commercial actors, leaving smallholders and local entrepreneurs without the resources or influence needed to compete, innovate or access nutritious foods.

At the same time, the rise of ultra-processed foods and growing market concentration are increasing health risks and deepening inequality. Meanwhile, the extraordinary diversity of locally adapted crops, traditional foods and Indigenous knowledge that could anchor more nutritious, resilient and inclusive food economies remains largely invisible to mainstream markets and investment flows. Real inclusion requires reshaping how food economies function.



In the department of Chiquimula, Guatemala, a group of women agreed to use a new bean variety that is transforming the way children in the region are fed. The biofortified Icta Chorti bean arrived to households seeking to alleviate one of the most serious problems affecting the country, child malnutrition.

What success looks like

Producers, processors, traders and buyers are able to leverage inclusive markets, finance and infrastructure, enabling innovation and entrepreneurship to thrive, creating secure livelihood opportunities and boosting prosperity. Diverse, nutritious and culturally grounded foods—rooted in locally adapted crops and Indigenous knowledge—are visible, valued and competitive in mainstream markets. As a result, healthier diets become more affordable and accessible, while economic opportunity and agency are distributed more equitably across food systems.



Our approach

We build inclusive food economies by working directly with farmers, entrepreneurs, vendors, processors, governments, civil society and consumers to create equitable, resilient and sustainable markets and financing systems. Our science brings together social, ecological and economic dimensions of resilience so that more people can prosper.

Through learning networks, value chain platforms and entrepreneurship programs, we help smallholders and microenterprises—especially those led by women and young people—**build and sustain profitable trading relationships** that support long-term, inclusive economic growth.

Generating and applying evidence

We generate clear, practical evidence about how food markets function: who participates, who is excluded and what makes markets fair and equitable. In many low- and middle-income countries, **the majority of food system actors work in informal markets**, and our research shows that these markets remain essential to national food and nutrition security. We study how they function and design **practical solutions** that make them safer, more inclusive and more resilient. Our aim is not to replace these markets, but to strengthen their ability to deliver healthy diets and stable incomes to more people.

We also examine how inclusive markets can advance ecological, social and economic goals. In Kenya, for example, increasing the visibility and safety of women vendors **strengthened local economies and expanded access to diverse, affordable diets**. We are also developing **digital platforms** that connect traders and consumers, while strengthening links between rural producers and urban markets.

We study opportunity crops, such as millets, legumes, roots and tubers, bananas and leafy vegetables, and demonstrate how targeted investments in research and development can help open new markets, sustain traditional foodways, protect ecosystems and improve diets. To unlock these benefits, we help farmers, traders and consumers access **improved knowledge, quality seeds, fair and equitable financing and reliable trade networks**.

Community seedbanks, such as India's *Dharti Naturals*, illustrate this approach in practice. By purchasing farm-saved seed and marketing it under their own brand, farmer producer organizations transform community seedbanks into **viable seed enterprises** that conserve agrobiodiversity while increasing and diversifying farmer incomes.

In Kenya, inclusive market linkages co-created with **informal fruit and vegetable vendors, youth** market facilitators and other **midstream actors** are improving market access and livelihoods for small-scale agroforestry farmers in rural areas. Vulnerable urban consumers in the Viwandani informal settlement also benefit from improved access to affordable, safely produced fruits and vegetables, illustrating an alternative to Kenya's dominant food system.



The Pan-Africa Bean Research Alliance (PABRA) is helping transform bean value chains through farmer-centered innovation and nutritious bean varieties.

Strengthening capacity, inclusion and collaboration

We strengthen the capacity of farmers, traders and entrepreneurs—**especially women and young people**—to participate fully in inclusive food economies. By combining technical innovation, business skills and social empowerment, we help actors across value chains increase incomes and resilience. Evidence shows that inclusive market systems with strong participation from smallholders, cooperatives and small and medium enterprises (SMEs) can **increase producer incomes by up to 25%**, while contract farming arrangements can raise incomes by **up to 54%**.

Women's contributions, as well as the gender-specific barriers they face, are often overlooked in **market systems**. Through gender-transformative approaches, we help address the systemic barriers women encounter in agrifood markets, including mobility constraints, financial exclusion and limited access to information.

Youth unemployment and migration also remain major challenges. We create **meaningful economic opportunities for young people** in rural areas, particularly in value addition, agribusiness, digital innovation and land restoration.

We help women and young people become **leaders and innovators**. In Honduras, our work with Volcafe and Olam Food Ingredients (ofi) has informed more equitable business practices and strengthened supply chains. In Senegal, our Gender-Smart Accelerator Challenges help women-led small and medium enterprises build climate-resilient agribusinesses and access private capital. These programs provide women and young entrepreneurs with the skills, mentorship and finance they need to become **local drivers of innovation and job creation**.

We also strengthen **networks among small and medium enterprises**. By using each other's services—including courier networks, seed suppliers, biofertilizers and packaging providers—small businesses can build more resilient and investable local economies.

To support these efforts, we expand access to **finance, investment, skills and markets**. We connect small businesses with private capital to help close the financing gap. We also help partners access agricultural insurance, credit guarantees and carbon credit schemes that reduce risk, stabilize incomes and promote sustainable practices.



TraceFoodChain is an open-source digital traceability tool co-created with farmers and cooperatives. It helps Honduran coffee producers meet new sustainability and deforestation free-trade standards, including the EU Deforestation Regulation.

Shaping policy and decision-making to drive systemic change

We work with policymakers, institutions and investors **to create enabling environments where inclusive food economies can thrive**. We turn evidence into action so that rural and urban development strategies align with goals for poverty reduction, inclusion, nutrition and climate resilience.

A key focus of our policy work is **supporting informal food actors**—the vendors, traders and processors who feed most people, yet often lack a voice in decision-making. In low-income countries, the informal food economy is largely agricultural and heavily reliant on women, young people and older workers. We help bring their perspectives into policy discussions on food safety, infrastructure and access to public space.

Our goal is not to formalize these systems, but to **strengthen them**. We identify the ‘missing middle’ and help address barriers, such as limited access to finance, appropriate technologies, business skills and growth opportunities.

Through **multi-actor platforms** that bring together farmers, traders, consumer groups and investors, we support shared learning, innovation and joint decision-making. Public procurement—including school meals, hospitals and institutional purchasing—can create **stable demand for a diverse range of nutritious, locally produced foods**, strengthen rural-urban linkages, and reduce the risks farmers face when producing local crops that are not yet fully integrated into commercial markets.

Looking forward: high-impact transformations

6 Youth-led agri-tech innovation hubs

We will invest in next-generation talent and entrepreneurship to accelerate local solutions, innovation and employment in sustainable agriculture and food systems. These investments will help cultivate a new generation of changemakers capable of driving local innovation and employment. Evidence shows that supported entrepreneurs can attract up to twice the financing they initially receive while creating new employment opportunities.

7 Circular bioeconomy in agriculture

We will promote waste-to-value innovations—including biofertilizers, biogas and composting—to reduce emissions, improve soil health and create green jobs in rural areas. By turning agricultural waste into valuable resources, these approaches can strengthen circular economies, reduce environmental impacts and generate new market opportunities.





Diversified diets for improved nutrition and livelihoods

We have mapped complex food environments spanning rural and urban, as well as formal and informal markets, to guide interventions that make healthy and sustainable food choices not only accessible but also appealing. This includes integrating diverse Indigenous crops into school meals through local procurement and community programs; in 2024 alone, over **2.7 million African children accessed high-iron beans** through school feeding initiatives. We have also influenced national food-based policies, including in Ethiopia and Vietnam, that promote the benefits of diverse diets. In parallel, we contributed to global nutrition science through **the Periodic Table of Food Initiative**, the world's largest effort to map the molecular “dark matter” of food, generating food composition data that can support healthier, more diverse and sustainable diets.

OUTCOME 4

Healthy Diets for All

The food and land systems challenge

Access to healthy, sustainable diets is shrinking. Food and diet choices are shaped by multiple influences, from convenience and advertising to nutrition and cooking knowledge. At the same time, food systems are becoming more uniform and increasingly dominated by ultra-processed, nutrient-poor foods that contribute to both obesity and undernutrition.

Climate change, conflict, pandemics and economic shocks continue to strain supply chains, while rapid population growth and urbanization are reshaping demand. Meanwhile, large corporations have the power to expand access to diverse and healthy diets, yet often continue to market unhealthy products—underscoring a central paradox of today's food systems.





What success looks like

People—including vulnerable and marginalized groups—are able to access and consume healthy, safe and sustainable diets, even during shocks and crises.

Our approach

We work to **reshape food cultures, institutions and daily food choices** so that diets support both human and planetary health. Our research connects **what farmers produce, how food is marketed and what people want and can afford**, helping create food environments where nutritious and safe diets are **accessible, appealing** and ultimately, **consumed**.

We work at the nexus of **science, policy and practice**, generating evidence on diet quality, affordability and environmental impacts. Governments, businesses and civil society partners use this evidence to improve policies, shape food environments and design investments that advance nutrition and sustainability goals. For example, our scientists contributed to the scientific foundations of the *EAT-Lancet Commission* collaboration that developed the Planetary Health Diet Guidelines. Together, we help make healthy diets a **realistic and desirable choice** for all, while protecting the landscapes and ecosystems that sustain them.

Generating and applying evidence

We study how **governance, markets and consumer behavior** influence what people buy and eat. We use this evidence to identify clear entry points for improving food environments, both by increasing the availability of healthy and diverse foods and by strengthening demand for them. Because food choices are shaped by price, availability, desirability and knowledge, we design solutions that address **all four factors simultaneously**.

We also connect **consumer needs** directly to **resilient production systems**. This includes strengthening seed systems for biofortified and opportunity crops so farmers can grow foods that align with people's nutritional expectations and taste preferences. This work expands access to diverse and nutritious foods while making markets and food systems more resilient to climate and economic shocks.

We also support **low-emission livestock systems** in regions where animal-sourced foods remain essential for nutrition and livelihoods. More than one billion people rely on livestock for their livelihoods, while foods such as milk, eggs and meat provide essential nutrients, particularly for vulnerable populations. We help ensure these foods are produced in ways that support both human and environmental health.

Our research also shows how **climate extremes, conflict and economic shocks** disrupt diets. We identify practical measures—such as diversified food production, stronger safety nets and more resilient supply chains—that help ensure nutritious diets remain accessible during crises.

Food safety is a core component of healthy diets. We work with regulators and research institutions to **monitor contamination, reduce postharvest losses** and strengthen **trusted food safety systems** across both formal and informal markets. In cities, such as Hanoi, our research shows that replacing traditional markets with supermarkets can reduce affordability and weaken diet quality for low-income households. Instead, we work with policymakers to **improve food safety standards across all retail formats**, enabling traditional markets to continue playing an essential role for the urban poor.

Strengthening capacity, inclusion and collaboration

We strengthen the capacity of **producers, vendors and consumers**—especially women and young people—to participate actively in food systems that deliver healthy and diverse diets. We support women as leaders in nutrition, production, household budgeting and business development. We also engage men as allies in supporting healthier diets and more equitable household relationships.

We provide education and training that help women manage **seed selection, home gardens and vegetable production**, improving both household nutrition and local food supplies. We also work with chefs, community leaders and food champions to celebrate **diverse, culturally meaningful foods** and build demand for healthy and appealing diets.

We partner with health organizations to reach **underserved urban communities**, improving access to safe and nutritious foods, while strengthening connections between urban consumers and rural producers.



In Kenya, we partner with health organizations, such as the Diabetes Awareness Trust, to promote organic, low-chemical fruits and vegetables in underserved communities, expanding access to safe, nutritious foods and strengthening links with rural producers.

Shaping policy and decision-making to drive systemic change

We work with governments, businesses and civil society to create the **policies, incentives and investment mechanisms** needed to make healthy diets the norm. From large agribusinesses to informal street vendors, companies play a major role in shaping what people eat.

We co-develop **profitable and inclusive business models** with private sector partners to make nutritious foods—including local crops, wild foods and non-timber forest products—more available, accessible, desirable and affordable for consumers, particularly for vulnerable populations.

We develop tools—such as **PlaSA Colombia**, food-flow mapping and foresight analyses—that turn fragmented data into clear insights for policymakers. These tools help countries identify the **true cost of healthy diets**, the infrastructure needed to support them and the policies required to deliver them at scale.

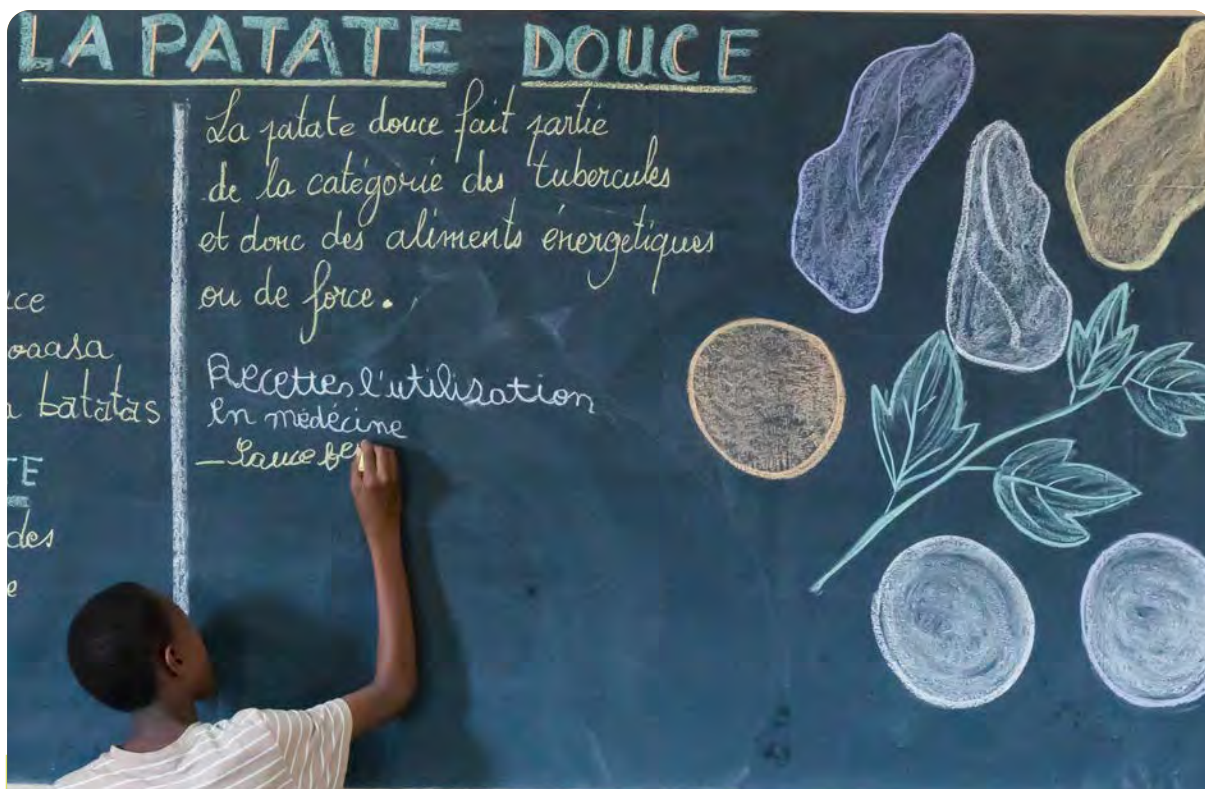
We also support effective **incentives and regulatory measures**, including labeling standards, and food-based dietary guidelines. Through South-South learning networks, countries across Latin America, Africa and Asia share experiences and lessons on how these tools can improve access to healthy and diverse diets.

Public procurement, including **school meal programs**, is a powerful lever for system-wide change. When linked to nutrition education and local procurement, school meals can **improve children's diets**, create inclusive and stable markets for diverse, locally produced foods, and strengthen resilience to shocks. Because most school meal budgets are financed through national public funding, coordinated policy action in this area offers a strong platform for long-term transformation.

At the same time, we work with companies to **scale regenerative and inclusive sourcing practices**, while maintaining attention on the growing risks associated with ultra processed foods.

Finally, we bring together actors across agriculture, health, trade and urban planning to ensure nutrition becomes a **shared responsibility** rather than a policy gap. Through evidence-based advocacy, we help governments integrate diet quality into national food strategies, climate plans and investment frameworks. We also support cities in designing food policies that connect urban markets with surrounding rural landscapes, making diets more nutritious, locally grounded and culturally relevant.





School meals do more than feed children: they shape healthy habits, diversify diets, strengthen local food systems and increase farmer incomes. Our research shows that well-designed school meal programs can help build healthier communities and more resilient food systems.

Looking forward: high-impact transformations

8 Food systems for nutrition and health

Our goal is to make nutritious and diverse foods the easy choice for everyone, especially underserved populations. We are moving beyond a focus on sufficient calories to prioritize overall diet quality. By combining health-sector data with agrobiodiversity research and breakthroughs from **the Periodic Table of Food Initiative**, we help our partners address the drivers of malnutrition and diet-related diseases before they escalate into major public health challenges.

9 Policy intelligence for food systems transformation

Our data-driven foresight models bring together climate, health and biodiversity priorities to support more integrated and coherent policymaking. By replacing fragmented policy silos with connected evidence and decision-support tools, we help governments align priorities, improve resource use and accelerate action across food systems.

By adapting global evidence to local realities, these tools strengthen policy relevance and support governments in driving timely, ground-level action for resilient, inclusive and nutrition-secure food systems.

Transforming food systems through partnership and innovation

Across Africa and Latin America, two long-standing collaborative platforms are demonstrating how science, innovation and partnership can transform food systems at scale. The **Pan-Africa Bean Research Alliance (PABRA)** brings together research institutions, governments, regional and global donors, seed systems, markets and farming communities across **31 member countries** to strengthen bean value chains through farmer- and market-driven innovation. Through the development and adoption of improved bean varieties, PABRA has contributed to **greater food security, nutrition, resilience and livelihoods** across the continent. Similarly, **the Latin American Fund for Irrigated Rice (FLAR)** unites research institutions, producers, governments and partners across **17 countries in Latin America and the Caribbean** to advance resilient, competitive and sustainable rice systems. Through collaborative research, locally adapted technologies and farmer-centered innovation, FLAR has **strengthened rice value chains while supporting productivity, sustainability and capacity development** across the region.

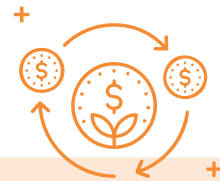
WELCOME



BIENVENIDOS

Leveraged Financing and Investment for Impact

The food and land systems challenge



Scientific advances are accelerating progress in agrobiodiversity, landscape restoration, inclusive food economies and healthy diets. Yet too few of these solutions are reaching the scale the world urgently needs. Transforming food and land systems to meet global goals on climate, equity, nutrition and sustainability requires an estimated USD 300–350 billion annually. Yet only a fraction of that financing is delivered, and an even smaller share reaches the farmers, cooperatives and small enterprises driving change on the ground.

This chronic underinvestment creates structural barriers: innovations often stall between research and adoption; farmers, enterprises and public programs frequently lack the governance and operational capacity needed to attract investment; and financial institutions lack the trusted evidence, standards and tools required to deploy capital confidently toward sustainable food and land systems.

At the same time, public-private partnerships in this space are expanding. Private capital mobilized with support from multilateral development banks to low- and middle-income countries reached USD 87.9 billion in 2023. This signals growing investor interest and the expansion of blended finance mechanisms. The opportunity now is to channel this momentum more strategically toward food and land systems transformation, ensuring that increased capital flows translate into systemic impact where it matters most.

Closing this gap requires more than generating knowledge. It requires connecting science, innovation, users and finance into a coherent enabling ecosystem that accelerates the adoption of proven solutions. Sustainable food and land systems must become a compelling destination for investment at scale, supported by the right evidence, tools and financial instruments.





What success looks like

Scientific discovery, innovation and finance operate as a continuous system in which farmers, enterprises and investors adopt science-based solutions at scale, supported by strong innovation ecosystems and aligned financial instruments. Public and private finance act as catalysts for food and land systems transformation, directing investment toward entrepreneurs and resilient food systems that deliver benefits for climate, equity and prosperity, while nourishing people and the planet.

Our approach

The Alliance connects scientific excellence, innovation partnerships and financial systems to translate research into investable solutions, and investable solutions into impact at scale. We achieve this through three interconnected elements of the innovation-to-impact continuum: aligning innovation “push” with finance “pull,” supported by investment readiness.

We create enabling environments for success by influencing public policy, climate finance frameworks and private sector capacity, with risk management embedded at every stage.

Innovation push—turning promising research into practical, market-ready solutions

The Accelerate for Impact Platform is the Alliance’s dedicated venture space, bridging scientific discovery and adoption. Through entrepreneurial and venture-building models, the Alliance co-creates innovations with industry partners, supports spinouts and startups, and connects CGIAR research with agri-tech ecosystems worldwide.

The Accelerate for Impact Platform also strengthens internal and external innovation capacity by equipping researchers and partners with skills in intellectual property management, market validation and go-to-market strategy. This helps ensure that the Alliance’s research pipeline and partners continuously generate validated, adoption-ready solutions.



Programs including AgriTech4Egypt, AgriTech4Kenya and CircularEconomy4Colombia have already supported more than 400 promising innovations through business training, pilot testing and investor connections, demonstrating that science-to-market pathways can be developed systematically and at scale.

Investment readiness—attracting, absorbing, and managing investment for smallholders

Innovation alone is not enough. The **Investment Readiness** mechanism bridges the critical gap between innovation and finance, enabling agribusinesses, cooperatives and development programs to become effective channels for adoption. Through business acceleration, technical assistance and science-based analytics, the Alliance helps partners, such as the **Business Acceleration for Youth** Initiative in Malawi, improve their governance, operational capacity and market linkages.

The Alliance also leads regional public-private alliances for strategic crops, including the Pan-Africa Bean Research Alliance (PABRA) and the Latin American Fund for Irrigated Rice (FLAR). These platforms support entire value chain ecosystems, from research to markets, by embedding scientific advances within networks of small and medium enterprises, producer organizations and investors.

In parallel, the Alliance works with national governments to advance their Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). We help translate national climate commitments into specific, bankable portfolios of small businesses and value chains, shifting the focus from broad policy ambitions to transaction-ready investment opportunities.

Finance pull—embedding scientific evidence into financial decision-making

The **Finance Pull** connects science, finance and policy at scale, guiding investment toward measurable impact. The Alliance integrates science-based indicators across the full investment lifecycle— from fund design and due diligence to monitoring, reporting and verification—ensuring that investments are transparent, measurable and accountable. Our dedicated platform, **ImpactSF**, works with research teams across the Alliance to embed food and land systems science directly into financial mechanisms.

We engage across the financial system, from capital markets and asset managers to commercial banks and local financial intermediaries. With asset managers and impact funds, ImpactSF co-designs investment vehicles and blended-finance structures, provides climate and natural capital risk assessments, supports investment due diligence and delivers post-investment monitoring and verification systems. With banks and local financial institutions, it develops climate-linked credit-risk tools, co-designs lending products that respond to real needs on the ground, and strengthens institutional capacity to position agriculture as a viable investment opportunity rather than a risk exposure.

Active investment vehicles, and partners include the Climate-Smart Food Systems Fund (responsAbility), the Amazon Biodiversity Fund (Impact Earth), the Financing for Agri-SMEs in Africa Facility (I&P), the Rwanda Green Fund, the Fairtrade Access Fund (Incofin) and the AGRI3 Fund (Rabobank/IDH). Other next-generation vehicles, including the Ag360 Climate Fund and the Tropical Resilience Fund, are currently in design.

ImpactSF works with financial institutions across more than 15 countries to assess agricultural lending portfolios for climate and nature-related risks and co-develop climate-smart loan products. This includes support to a USD 130 million facility developed with the United Nations Development Programme (UNDP) and Global Green Growth Institute (GGGI), targeting 90,000 farmers across West Africa. Together, these vehicles and partnerships represent a portfolio targeting more than USD 1 billion in capital deployment.

By providing a shared scientific framework across climate, biodiversity and nutrition finance, the Alliance helps reduce investment barriers, unlock capital for SMEs and smallholders, and ensure that these investment streams reinforce rather than duplicate one another.



Looking forward: high-impact transformations

10 Science-powered investment intelligence

The Alliance will develop the next generation of investment intelligence tools, translating climate, nature, nutrition and livelihood outcomes into comparable, science-based indicators that banks, asset managers and impact investors can apply at portfolio scale. This will help lower the barriers that have historically limited capital flows to smallholders and small businesses across the food and agriculture sector.

11 New instruments for a new era

The next frontier of finance requires new instruments—including outcome-linked bonds, resilience-linked securities and loans tied to measurable environmental and social performance—in response to growing investor interest in food and land systems. We will support this emerging market by co-designing instruments with financial partners and providing the rigorous impact metrics needed to make them credible and investable.

12 Inclusive and local innovation ecosystems

We will connect local financial institutions, small businesses, innovation ecosystems and research actors into more coherent investment pipelines, making it easier for capital to reach the farmers and enterprises driving food and land systems transformation. This includes engaging women- and youth-led businesses, Indigenous communities and local banks as active partners in investment and innovation design.

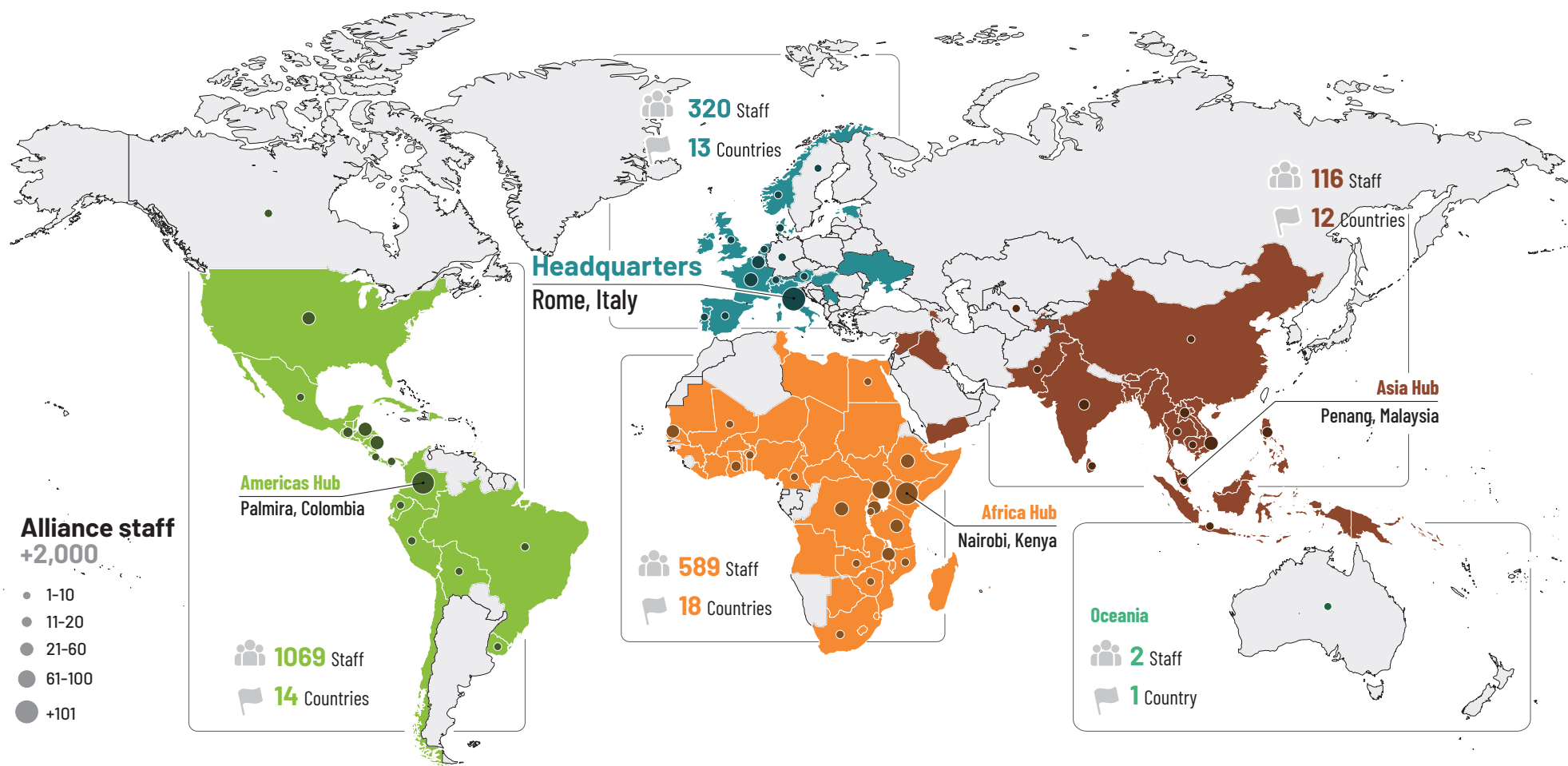
Where We Drive Change

With more than 2,000 staff across regional and national offices and research stations on five continents, the Alliance is well-positioned to drive global impact.

Regional hubs in Africa, the Americas, and Asia and the Pacific, ensure that our research is grounded in local realities. Working closely with policymakers, scientists, government extension workers, farmers, private sector partners, market system actors and organizations focused on nutrition and health, we turn evidence into action. By engaging in national and regional dialogues on food and land systems, we help shape policies, guide investment and build capacity for transformation.

Across the regions, our science is supported by four key approaches:

1. **Capacity building** focused on developing the next generation of scientists and innovators working to transform national food systems.
2. **Social inclusion** that recognizes youth and women as key drivers of change.
3. **Aligning with regional and national priorities** through support to agricultural research and extension services.
4. **Engagement with private sector entrepreneurship pathways** to disseminate and scale innovations.



*Biodiversity International and CIAT current projects as of April 2026

The boundaries and names shown on this map do not imply official endorsement or acceptance by the Alliance of Biodiversity International and CIAT.

Africa

Africa is poised to play a leading role in global food and land systems transformation. Africa's diverse landscapes, among the world's most vital biodiversity hotspots and huge carbon sinks, underpin the food security, water supply and climate resilience that sustain a rapidly growing, youthful population, while also providing the natural capital and inspiration driving innovation in agriculture, technology and green entrepreneurship.

Expanding regional trade and stronger integration of smallholder farmers into market systems offer new pathways to prosperity. Rapid urbanization and demographic change are reshaping the continent, bringing both challenges and opportunities.

Targeted research investments, co-created with African institutions, can help address the very real issues that still need tackling on the continent. One in five Africans remains undernourished, and limited access to diverse, affordable foods continues to constrain nutrition outcomes. At the same time, climate shocks, soil degradation, and biodiversity loss undermine productivity. Eighty percent of land degradation in sub-Saharan Africa results from soil erosion^{xiv} while agriculture-related emissions account for around 58% of greenhouse gas (GHG) emissions across the continent.^{xv}

The Alliance engages across Africa through agile public-private partnerships and deep regional and national policy engagement. Our work contributes directly to the Kampala Declaration under the Comprehensive Africa Agriculture Development Programme (CAADP) on Building Resilient and Sustainable Agrifood Systems in Africa, adopted by the African Union in 2025.

We provide science-based policy advice that supports countries' climate goals, agroecology, deforestation-free market systems and sustainable land management. We also strengthen pro-smallholder policies and implementation, such as fair pricing, equitable land rights and improved financial access. Through co-developed multistakeholder platforms, we foster inclusive agribusiness growth and strengthen public-private partnerships that drive change.



Asia and the Pacific

Asia and the Pacific feed more than half of the world's population and sustain the livelihoods of over two billion smallholders. The agricultural sector employs 563 million people in the Asia-Pacific region, accounting for 30% of total employment.^{xvi}

The region faces a deepening paradox: the intensification that drove historic yield gains is now eroding the soils, water systems and biodiversity that agriculture itself depends on. Agricultural activities consume up to 90% of freshwater resources.^{xvii} Shifting diets and growing social exclusion add further pressures, while rising urbanization and income growth are driving demand for ultra-processed foods, contributing to rising rates of obesity and diet-related diseases, including in children.^{xviii} Women, youth, smallholders and marginalized communities are often excluded from access to land, finance and decision-making. Pacific Small Island Developing States (SIDS) face particular vulnerability.

The region's scale, diversity and innovation potential offer immense opportunities to advance regenerative, agroecological and nature-positive food and land systems. These approaches strengthen climate adaptation, reduce emissions, promote healthier diets, revitalize agrobiodiversity, and foster more inclusive and resilient markets. They also expand access to finance and digital innovations that help scale solutions and improve traceability and transparency across value chains. Strong cooperation among governments, civil society and the private sector is essential to driving this transformation.



Latin America and the Caribbean

Latin America and the Caribbean (LAC) combine immense potential for food and land systems transformation with exceptional ecological diversity, dynamic innovation ecosystems and strong public-private sector partnerships. The region is a global food basket, accounting for around 14% of global food exports and holding more than 40% of the world's terrestrial biodiversity.^{xix}

LAC is also a leader in green innovation, pioneering regenerative agriculture, sustainable finance, Indigenous territorial stewardship, agrobiodiversity conservation and new incentives for deforestation-free commodities. Across the region, youth agripreneurs are advancing traceability, sustainable logistics and digital solutions for more resilient food systems.

However, the region faces mounting climate risks. Agriculture and land-use change account for 46% of greenhouse gas emissions,^{xx} while soil degradation, deforestation and water stress threaten productivity and rural livelihoods. At the same time, more than 60% of adults are overweight or obese,^{xxi} highlighting deep inefficiencies across food systems.

Smallholders and Indigenous producers are often excluded from markets, while women and young people continue to face barriers to land, credit and technology. Strengthening inclusive market systems that promote diet diversity and resilience is essential to unlocking equitable, low-emission growth across the region.

The Alliance engages across Latin America and the Caribbean through agile public-private partnerships and strong engagement in regional and national policy processes. Working with governments, research institutions and the private sector, we seek to drive lasting impact through inclusive and sustainable transformation pathways grounded in innovation and knowledge exchange.



Europe

Headquartered in Rome, Italy, Europe serves as a strategic hub for global engagement. Through close partnerships with the Rome-based UN agencies—the Food and Agriculture Organization, World Food Programme and International Fund for Agricultural Development—as well as with the agriculture, food and environment research hub in Montpellier, France, we connect science to the international policy processes shaping food systems worldwide.

In Leuven, Belgium, we steward the International *Musa* Germplasm Transit Centre, a genebank that holds the world's largest collection of banana germplasm. Our Cacao of Excellence program, based in Italy, links biodiversity-rich, sustainable production and premium markets for high-quality chocolate, improving farmer livelihoods while generating strong incentives for conservation.



SCIENCE IN ACTION

Tackling the urgent crises in food and land systems



CGIAR IMPACT AREAS

THE CHANGE WE WANT TO MAKE

Unleashed agrobiodiversity for climate, food and nature.

Genebanks, breeders, farmers and seed systems working together to safeguard, improve and deliver resilient, productive, sustainable and nutritious solutions.

Future-proofed farms and landscapes.

Farmers, communities and supporting institutions innovating together to build equitable, climate-resilient and environmentally sustainable systems that deliver food, income and ecosystem benefits.

Inclusive food economies,

where producers, processors, traders and buyers leverage inclusive markets, finance, and infrastructure, providing secure livelihood opportunities and boosting prosperity.

Healthy diets for all,

where people, including vulnerable and marginalized groups, can access and consume healthy, safe, sustainable diets, even in times of shocks and crises.

Leveraged financing and investment for impact.

Mobilizing public and private capital to transform food and land systems—channeling investment to entrepreneurs driving resilience, equity, climate action and shared prosperity.

WHAT WE DO

Bank on agrobiodiversity

by safeguarding, improving, and promoting the equitable use of agrobiodiversity including opportunity crops.

Make farms and landscapes thrive

by restoring and managing diverse crop, tree and livestock systems so landscapes are resilient, resource-efficient, and deliver equitable social, economic and nutritional benefits.

Unlock climate action

by building climate resilience and reducing emissions in farms, landscapes and food systems.

Enable healthy food choices

by raising consumer awareness on the benefits of healthy diets, and transforming food environments to increase the availability, accessibility, quality, desirability and convenience of a healthy diet for all.

Boost inclusion and prosperity

by enhancing the livelihoods of women, youth, indigenous people and marginalized groups and their power in the governance of food and land systems.

HOW WE DO IT

Rewire knowledge and data

by connecting data streams and knowledge communities to enable timely decisions about food and land systems that are scientifically sound, inclusive, ethical and targeted.

Innovate for impact

by catalyzing and connecting science-based innovation and investment that deliver measurable change for food and land systems.

Enable system change

by engaging diverse partners to co-develop and apply evidence that informs and aligns policies, finance and institutional frameworks, creating the conditions to transform food and land systems.

Embody institutional excellence

by ensuring a fit-for-purpose, digitally enabled organization that is effective, efficient and agile in mobilizing resources and delivering high-quality services that integrate sustainability principles.

Cultivate a culture for change

by advancing an inclusive culture that inspires collaboration, excellence and co-ownership to deliver our mission.

FOUNDATIONS FOR SUCCESS

● Cultivate a Culture for Change

● Embody Institutional Excellence

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