

Resilient and sustainable LAC agri-food systems: Driving global food security, inclusive growth, and reduced out-migration

| Initiative Lead and Co-Lead | Primary CGIAR Action Area | Estimated 2022 - 2024 Budget |
|--|-----------------------------|------------------------------|
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Challenge

LAC holds the planet's largest reserve of arable soils, 30% of renewable water, 46% of tropical forests and 30% of biodiversity, making a massive contribution to global food supply and other planetary ecosystem services(bit.ly/3wZ5u2T). Climate change and natural disasters, exacerbated by COVID-19, have eroded CAC economic and food security, destabilizing communities and triggering exports of people instead of food. In 2010, intraregional immigrants reached 63% of all LAC migrants (28.5 million) (bit.ly/3mLBhj4). Further breakdown of LAC's most vulnerable agri-food systems will push millions globally into food insecurity, unleash unprecedented migration, especially of young people, and jeopardize achieving the SDGs of 'zero hunger', 'reduced poverty', and 'life on land'.

LAC's resource-intensive agricultural production model has reduced agri-food system resilience and increased conflicts with its global environmental function. Agricultural expansion and intensification, and urbanization have degraded over 20% of LAC forests and farmlands, with negative effects on productivity, carbon storage, and biodiversity, especially in the Andes. 69% of GHG emissions come from land-use changes(bit.ly/3goZHOj).

Regional food production depends on smallholders, who produce 60% of food(bit.ly/3mVmEcX). Their livelihoods are threatened as 31% of LAC cropland is becoming less suited to changing climates(bit.ly/3goZHOj). Farmers lack access to training, improved technologies, and remunerative markets. High uncertainty due to climate variability discourages new investments in agriculture. Agricultural value chains fail to incentivize resource efficiency, agricultural diversification, and inclusivity. Simultaneously, unhealthy diets are causing obesity and malnutrition. Socio-economic disparities are more pronounced for women and indigenous peoples, whose participation in agri-food system innovations is hindered by deep-seated inequalities.

Objective

The overarching objective is to increase the resilience, sustainability and competitiveness of LAC agri-food systems so that they are better equipped to meet urgent food security needs, reduce climate threats, stabilize conflict-vulnerable communities, and reduce out-migration. This embraces the specific objectives of: 1. Establishing participatory, inclusive R4D innovation hubs in 8 countries. These will pilot, finetune, and scale a suite of climate-resilient, sustainable, nutrition-sensitive production strategies in diverse LAC agroecological zones, that will bring 500,000 ha of land under sustainable management by 2024. Primary focus will be in five CAC countries (El Salvador, Guatemala, Haiti, Honduras, Nicaragua), and specific work packages will be implemented in Mexico and Andean countries (Colombia, Peru) using existing capacities and high potential for achieving outcomes at scale with reduced investment costs.

2. Strengthening the agency, skills, and capacity of extension systems in 5 countries to support farmers, including women and youth. This will allow adopting improved technologies (for nutrition, climate resilience, and yield), low-emissions strategies, and water/soil/biodiversity management best practices emerging from the participatory R4D innovation hubs across diverse agroecological zones.

3. Extension systems in 5 countries are equipped with better on-farm technologies, digital agro-climatic advisory tools and traceability mechanisms to support farmers and agricultural small/medium-sized enterprises (agri-SMEs) to better integrated risk management, enhanced value creation, access to finance and remunerative agricultural product offtake.

4. Assisting 3 LAC countries to use CGIAR research findings to shape and/or implement multi-sector, inclusive, transformative agri-food sector policies and robust Nationally Determined Contributions (NDC) and National Adaptation Plans (NAPs).

Theory of Change

The Initiative will strengthen LAC agri-food systems' resilience, sustainability and competitiveness, enabling them to better meet food security needs, reduce climate threats, stabilize conflict-vulnerable communities, and reduce out-migration through CGIAR strong regional/national networks. Initiative's public-private-social partnerships will be underpinned by financial investment, research-for-development networks (R4D), and transformative policies linking climate security to food systems management. These partnerships will drive piloting and scaling co-developed, socially-inclusive, and socio-technical innovations. Initiative's innovations will increase agri-food system competitiveness, foster more climate-resilient value chains, and de-risk targeted food security systems (maize/beans,/rice/cattle) and commercial crops (coffee/cocoa). Our approach harnesses and creates: a)new data, tools, and de-risking mechanisms; b)multi-stakeholder policy engagement; and c)participatory inclusive R4D innovation hubs, primarily in areas of extreme climate vulnerability, low agricultural productivity, out-migration, and instability across Central America and the Caribbean(CAC), and simultaneously in Mexico and Andean countries-where UN and other development agencies will facilitate broader scaling and multiplication-as vehicles to: (i)co-develop, with producer organizations, tools for climate-resilient, sustainable, and nutrition-sensitive food systems; ii)work with national research and extension systems and youth-networks to close the digital gap on agro-advisory services; and iii)co-develop, with civil society, public- and private-sector actors, strategies for low-emission agroecosystems and value chains.

By 2024, these changes will: i)support stabilization of LAC international food prices (as the world's largest net-food-exporting region); ii)enhance conserving globally-important carbon sinks and biodiversity hotspots; and iii)build the foundations for resilient, inclusive agri-food systems to stabilize conflict-vulnerable communities and reduce out-migration from Central America. The Initiative builds on existing efforts (MasAgro, Andean Initiative, EiA, CCAFS) and on the Two-Degree-Initiative consultations.

Synergies with eight Initiatives: Building systemic resilience to climate variability and extremes; Transforming food systems from net carbon sources to sinks; Food systems transformation for healthy, safe, and affordable diets; Excellence in Agronomy; Climate-smart livestock; Agroecology across food, land, and water systems; National strategies and policies for driving transformation; and Levering gender & social equality in agri-food systems.



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Highlights

Strengthening LAC's dual role. LAC is the world's largest net food-exporting region, and a vital resource for planetary wellbeing, an (agro)biodiversity hotspot with one-quarter of the world's forests. This initiative protects these global assets by restoring broken food systems in destabilized communities that face out-migration, conflict, and environmental degradation.

Collaborative learning for rapid and demand-driven innovation. The initiative combines the power of proven existing R4D networks (CCAFS/Alliance/CIMMYT/CIP/IFPRI/HarvestPlus), for co-generation of value-creating innovations that increase competitiveness and de-risk food security and commercial crops. They enable rapid cross-learning to occur between the initial CAC countries, Mexico and Andean countries.

Innovation at the center of transformation. Innovation goes beyond technical solutions and needs a change in mindset. By bringing together public, private, and civil society actors (including indigenous people), with their different knowledge, goals and expertise, supported by data, we will create spaces for novel, concerted, inclusive and tailored actions.

Digital transformation to stabilize local and global agri-food systems. CGIAR's climate services work has reached over 350,000 LAC farmers (https://bit.ly/32eWZCn) demonstrating that using agro-climatic information for planning and decision-making results in crop-loss reduction, and enhanced yields, climate resilience and resource-efficiency, leading to increased agricultural incomes and nutrition security.

Sustainable agro-ecosystems for diversified, healthy diets. Resilient, competitive agri-food systems require strong, diverse linkages between social, economic and environmental dimensions. Joint efforts towards achieving sustainable, low-emission agroecosystems will enhance soil health, water availability and biodiversity management, critical for enabling shifts to diverse, sustainable, healthy diets.

Work Packages

| Scope of Work | | 3-year Outcomes |
|---|--|--|
| Climate-resilient, sustainable, and nutrition-sensitive local and regional food systems | Adoption pathways for high-yielding, stress-tolerant, nutritious crop varieties. Science-based management to optimize productivity of land, water, labor, biodiversity, and finance in integrated livestock-cropping systems and agroforestry. Capacity-building and technological innovations, tailored to women and youth, targeting small/medium farms where returns to innovation are high while enabling shifts to healthy diets | ≥3 producers associations increased their knowledge and capacities to facilitate the adoption of improved technologies (with increased nutritional quality, yield, and climate resilience) by farmers. ≥3 countries strengthened their policies to facilitate enhanced entrepreneurship in agri-services, value addition, and local marketing, contributing to climate-resilient, sustainable, nutrition-sensitive local/regional agri-food systems. |
| Gender-sensitive digital tools for de-risking agriculture, increasing climate resilience and underpin actionable knowledge creation in mixed farming systems. | Fine-tuning and scaling agro-climatic information and digital advisory services to support improved farm and risk management and agricultural investment and planning. Evidence generation and scaling agronomic options that promote climate resilience, and GHG emission reduction. Multiple-source information and knowledge for equitable, rapidly evolving, and actionable knowledge generation and management for innovation and transformational change considering unresolved practical and relational barriers (https://bitly.com/3goZHOj). | Extension systems in 5 countries are equipped with better on-farm technologies and digital agro-climatic advisory tools, to support farmers with integrated risk management strategies, facilitate value creation, and remunerative offtake of agricultural products. ≥3 high-capacity agri-SME partners deliver agricultural services, adopt traceability mechanisms, and facilitate financial investments. |
| Sustainable and low emissions agroecosystems, landscapes and value chains | Sustainability and emission-reduction indicators to track contributions to national and regional climate, poverty, mitigation and biodiversity goals. Digitally-enabled research-based tools supporting water and nutrient use efficiency, reduced pest/disease, and restored soils, ecosystem services, and biodiversity. Science and market-based solutions for climate change mitigation in local and export value chains. | Producers associations/extensionists of ≥5 countries are capable to support farmers to increase water- and nutrient-use efficiency, conserve biodiversity, reduce pests/diseases, and restore soils using research-based tools. Agri-food actors in ≥3 countries implement low-emission strategies, reducing GHG emissions and increasing productivity by 10%, also tracking contributions to national/regional climate, poverty, and biodiversity goals using sustainability indicators. |
| Hubs for agri-food innovation and scaling across countries for networking, knowledge exchange and co-creation. | Innovation hubs with physical infrastructure, including research platforms, modules, extension and impact areas that engage men, women, youth, and socially excluded groups in collaborative improvement of their productivity, income, nutrition, equity, and agency within agrifood systems(https://bitly.com/3goZHOj). Hub-based partnership with researchers, input suppliers, extension agents, traders, and processors to co-create knowledge and solutions and to foster technical, social, and institutional change. | Participatory and inclusive R4D innovation hubs are established in 8 countries with agrifood actors, enabling fine-tuning, adoption, and scaling of climate-resilient/sustainable/nutrition-sensitive production strategies in diverse agroecological zones. Producers associations, extension services and value chain actors in 3 countries facilitate the adoption of validated strategies by farmers in 500.000has enhancing short/long-term system productivity and profitability. |
| Policies and institutions for climate-resilient, competitive and low-emission agri-food systems | Supporting LAC countries to effectively deliver on NDCs/NAPs including gender-transformative approaches. Evidence-generation on regional climate security and migration through the interaction of socio-economic, climatic, socio-political drivers and their impact on regional and global security(Jarvis et al., 2021). Development of research-based decision-making tools for promoting climate-resilient and low emissions agrifood systems and policies. | Governments in 3 countries use OneCGIAR research to develop and implement transformative agri-food sector policies and robust gender-responsive NDCs/NAPs. Regional bodies develop policy instruments to facilitate coordinated investment by agri-food system stakeholders and shifts in government policy to better support climate resilience, competitive agri-food systems, and reduced out-migration. |



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Impact Area Contributions

| Nutrition, health & food security | A triple burden of malnutrition, exacerbated by climate variability, threatens LAC health and stability, especially in Central America. This initiative will contribute to improving nutrition, health, and food security through collaborative, socio-technical innovation for climate-resilient, sustainable, and nutrition-sensitive local agri-food systems and stabilized contributions to global food security. |
|---|---|
| Poverty reduction, livelihoods & jobs | Yield and productivity gaps, climate variability, and fragmented local agri-food systems drive food insecurity, poverty, and out-migration from Central America. This initiative enables new and increased agriculture-related incomes through enhanced digital capacity and agri-entrepreneurship that promote remunerative value chains, local economies, stability, and community resilience. |
| Gender equality, youth & social inclusion | Socio-economic disparities restrict participation in agri-food system innovation and income generation. This initiative expands capacity for women, youth, indigenous groups, and ethnic minorities to take leadership roles in farm-level production, and natural-resource management, household nutrition, and agricultural value chains (local marketing; value-added food processing) through tailored capacity development programs. |
| Climate adaptation & greenhouse gas reduction | Climate change exacerbates regional socio-economic and political problems, through low productivity, crop losses, lack of tools/mechanisms for local planning and decision-making, and increasing GHG emissions due to land-use changes. This initiative will facilitate across-scale climate adaptation, thus de-risking agri-food systems, making them more competitive, and providing science-based GHG-intensity reduction solutions. |
| Environmental health & biodiversity | Degradation of 20% of LAC forests and farmlands, with negative effects on productivity, carbon storage, and biodiversity, erodes the sustainability, competitiveness, and global environmental contribution of the region's agri-food systems. This initiative will promote adoption of climate-, water-, and nutrient-smart practices for enhancing multifunctional landscapes and enabling integrated crop-tree-livestock systems. |

Impact on SDGs



Regions

Latin America and the Caribbean (LAC)





PRELIMINARY CGIAR INITIATIVE OUTLINES

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Innovations

Indicators and tools for assessing food systems in terms of nutritional, food safety, resilience, and inclusitivy outcomes and trade-offs to guide enhanced agri-food systems policy development and implementation at national and subnational scales, that provide characteristics and drivers of consumers and producers' food environments, agri-food dynamics and climate-smart technological options.

Digitally-enabled agro-climate and e-extension system for local to national agri-food systems actors that engages existing extension services and hub networks to deliver advice, training and create knowledge, on how to respond to climate variability, sustainably increase productivity, sustainably diversify production, and participate in remunerative and traceable value chains.

Scalable traceability system for private sector, including agri-food SMEs, that supports them in delivering food security and environmental outcomes, while measuring and increasing agri-food system efficiency to reinforce competitiveness of local producers and overcome growing consumers' concerns in food safety and friendly environment goods.

Agri-food Innovation System (AIS) for agrifood system actors that enable value creation through participatory and context-specific testing and validation of climate-resilient, low-emission and nutrition-sensitive agricultural practices and technologies to provide options suitable for diverse farming households, agro-ecologies and value chains, and bring novel ways to facilitate innovation adoption and diffusion.

Civil society-public-private partnerships that leverage technological, institutional, and socio-economic analysis and modeling to co-develop tactical plans for agri-food systems transformation, including compliance with NDCs/NAPs and gender-transformative approaches. This will lead to active involvement of civil society in public-private partnerships to promote collective behavioral changes that positively impact agri-food systems.

Key Partners

| Demand | Government | Ministries of Agriculture, Environment and Finance, Food Security Agencies, Meteorological Sevices, NARES |
|------------|------------------------------------|---|
| | Multilateral | Regional government bodies: CAC, CCAD, CRRH, COMMCA, SIECA, IICA, ECLAC. |
| | Other | National and regional grower's associations (e.g. FLAR, FECAGRO, ACICAFOC, CNA, Fenalce) |
| | Private Sector | Consumer organizations, industry groups, food companies, trade associations. |
| Innovation | Academic, Training and Research | NARES (ICTA, DICTA, INTA, CENTA, INIFAP, AGROSAVIA, INIA) |
| | | Universities (e.g. Zamorano, CATIE, University San Carlos of Guatemala, University of Chapingo) |
| | Multilateral | FONTAGRO |
| | Private Sector | National and regional grower's associations (e.g. FLAR, FECAGRO, ACICAFOC, CNA, Fenalce) |
| Scaling | International NGO | FAO, WFP, other UN agencies, HRNS, RARE, CARE, CRS |
| | Other | Rural youth network for Central America and Dominican Republic |
| | Private Sector | Financial institutions: IADB, FONPLATA, BCIE, CDB, World Bank, BCIE, fund managers, financial, microfinance institutions. |
| | | National and regional grower's association, consumer organizations, industry groups, trade associations. |
| | Regional NGO | Local, national, regional NGOs (e.g. ASORECH, CASM, TNC, Conservation International) |

Theory of change

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Geographies:

- 5 focus countries: Guatemala, Honduras, El Salvador, Nicaragua, Haiti.
- 3 satellite countries: Mexico. Colombia and Peru.

Challenge

- LAC's broken agrifood systems push millions into food insecurity, reduced opportunities and outmigration, intraregional immigrants reached 63% in 2010.
- LAC's massive contribution to global food supply and to ecosystem services is threaten by climate change, unsustainable agrifood systems and social instability.
 Unhealthy diets exert a
- Unhealthy diets exert a grow burden of obesity and External malnutrition.
 External
 Final
- Weak and disconnected
 institutions impede
 progress towards
 climate-resilient,
 sustainable and
 competitive agrifood
 systems.



*Synergies with thematic initiatives to achieve intended outcomes: *Building systemic resilience to climate variability and extremes; *Transforming food systems from net carbon sources to sinks; *Food systems transformation for healthy diets; *Excellence in Agronomy; * Climate-smart livestock (3); * Agroecology across food, land, and water systems; *National strategies and policies for driving transformation; Levering gender & social equality in agrifood systems.

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