ClimBeR: Building Systemic Resilience against Climate Variability and Extremes

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

The adverse impacts of climate variability and extremes on food, land, and water systems are well documented. The resulting loss of productive assets and human capital, coupled with the effect of uncertainty on investments in agricultural innovation, frustrates smallholders' efforts to improve their livelihoods in risk-prone environments. There are three main roadblocks to systemic transformation: (1) lack of a transdisciplinary and multi-systems' approach to address the complexity of building resilience against climate variability and extremes, (2) limited farmer empowerment and adaptive capacity, and (3) failure to scale demand-led CGIAR innovations quickly enough to trigger systemic transformation.

Climate-resilience systems rely on numerous autonomous decisions and investments at diverse time-scales. A systemic transformation approach is needed to unite partnerships (including non-state actors), innovative finance, knowledge, tools, and policies to enhance farmers' adaptive capacity and catalyze transformational change. The approach must work across diverse contexts, at greater speed and adopt a political-economy lens that addresses power imbalances and socio-cultural factors.

To date, the incremental and piecemeal adoption of climate-resilience innovations has lagged behind the rapid shifts and tipping points in system productivity under climate variability and extremes. CGIAR and partners have developed good science and new technologies but, on their own, these have been insufficient to generate the required depth, pace and scale of change. The challenge is to deliver bundled market- and system-ready socio-technical innovation packages whereby millions of users are empowered at the scale and pace required to trigger systemic transformation and ensure that sustainable development is equitable and inclusive.

Objective

The Initiative aims to build more climate-resilience systems, benefitting twenty million farmers by 2024, to withstand climate variability and extremes. It aims to achieve this by generating knowledge about climate-security as an imperative for climate-resilience, and transforming this into action by connecting knowledge, innovations and institutions to specific regional and national challenges. The objective is to deliver impact-at-scale for 20 million farmers by 2024.

Climate actions can focus on adapting to changes already underway, or future-proofing systems so that projected adverse impacts are mitigated. While there are strong synergies between these two approaches, ClimBeR will focus on adaptation, achieving its overarching objective through a three-pronged approach:

(i) Co-developing climate-resilience innovation packages to enhance access to and use of technologies and practices that increase climate-resilience considering the inter-linked relation between climate, security and peace;

(ii) Enhancing climate-informed knowledge-exchange and risk-management services, helping farmers to: access critical meteorological information they currently lack, identify and address probable future climate risks, and access risk-management services. By coupling climate-informed knowledge-exchange with risk-management interventions, such as crop insurance and social protection programs, ClimBeR will foster climate-resilience systems;

(iii) Supporting policy and institutional reforms for transformational change, including those linked to the UN's Framework Convention on Climate Change and United Nations Security Council, and policy coherence across climate, food security, poverty, and peace, acknowledging the linkages across and between these dimensions and using a systemic lens.

ClimBeR builds on CGIAR achievements, comprehensive stakeholder-consultations (Two-Degree Initiative), and baseline studies that define an empirical approach to assess the relation between climate, peace and security.

Theory of Change

Climate-resilience is critical to farmers' ability to respond to and recover from climate variability and extremes. It relies on adaptive capacity and transformation. Science and novel technologies alone are insufficient to drive rapid and broad systemic transformation. Transdisciplinary networks and enabling environments enhance farmers' capacity to utilize socio-technical innovations that drive transformation.

ClimBeR is CGIAR's leading venue for research and innovation around systemic resilience against climate variability and extremes. With a global focus, ClimBeR will deliver radical, scalable climate-resilience solutions through global public goods, initially focusing on six countries as test sites to tackle on the ground issues, coupled with regional scaling. Building on a decade of CCAFS research, ClimBer will co-develop solutions with strategic partners (farmers, governments, National Agricultural Research Systems, commercial actors) and promote multi-scale governance including providing the right signals so that empowered farmers can enhance their resilience in the face of climate uncertainty.

Through: (a) co-developing climate-resilience innovation packages with the private sector; (b) enhancing climate-informed knowledge-exchange and risk-management services with partners in the development ecosystem; and (c) influencing national governments' policy and institutional 'tipping point' reforms, by 2024, digital-enabled bundled climate knowledge-exchange services developed by ClimBeR will be used by at least three digital service providers in each target country; ten programs of government, humanitarian and development institutions will utilize CGIAR climate science to steer US$500 million investments; fourteen climate-resilience policy decisions will be founded on CGIAR science; and scaling-partners in each target country will be using ClimBeR's innovations to empower farmers' climate-resilience decision-making. As the overarching CGIAR initiative on climate-resilience, ClimBeR will work with Regional Integrated and other Initiatives to link global public-goods with robust impact pathways and strategic partnerships for greater grassroots impact.

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Highlights

Trans-disciplinarity. Climate challenges are complex, uncertain and non-linear. Stakeholders may disagree about what causes the problems and what constitutes a 'solution', depending on their needs, knowledge, and aspirations. We, therefore, gather researchers, farmers, development-practitioners, and policymakers into action-oriented networks where 'research' and 'development' merge for robust, multi-level change.

Partnerships. In complex-situations, no single discipline has all the answers. ClimBeR brings together perspectives for solutions by combining biophysical and social-science researchers, worldwide, across disciplines. South-North and South-South partnerships will foster exchange of knowledge and experience, to help farmers and other stakeholders make autonomous, better-informed, climate-resilience decisions.

Climate-security focus. ClimBeR blends systemic risk modeling and foresight (e.g. climate-smart nutrition and integrated assessment frameworks), linked to the six focal countries' context-specific complexities. It builds on novel baseline studies defining an empirical approach to assessing the relation between climate, security and peace in these countries.

Socio-technical innovation bundles. ClimBeR bundles approaches and disciplines like interactive scenario-building, global systems science, big data, innovative use of climate and integrated assessment models, and innovative methods to understand societal climate risk responses. These novel combinations of innovations and tools will deliver radical solution packages for global impact.

Inclusivity. ClimBeR harnesses and expands the CGIAR's past critical mass of climate research, and enhances it by proposing a radically-transformative agenda that places systems thinking, and egalitarian and inclusive knowledge and action at its core, in line with the linked SDGs (see 10.3).

Work Packages

	Scope of Work	3-year Outcomes
Reducing risk in production system-linked livelihoods and value chains at scale	Managing and reducing the impact of variable weather and extreme events, including through enhanced digital services. This action will focus on addressing the systemic impacts of increasingly severe and extreme events, while contributing to reducing climate-related risk to protect and enhance production system-linked livelihoods, value chains, food and nutrition security.	By 2024, digital-enabled bundled climate knowledge-exchange services developed by ClimBeR to de-risk livelihoods and value chains are being used by at least three digital service providers in each target country, hence, reducing losses due to climate variability and extremes.
Building production-system resilience through considering the inter-linked relation between climate, security and peace	Leveraging CGIAR's land, water, and food systems science to address the climate-security-peace nexus contributing to relevant policies, programing, and finance. Given the danger of climate risk as a 'threat multiplier' adversely impacting peace and security, this WP will stimulate a virtuous cycle between climate-resilience, and the climate-security-peace nexus.	By 2024, CGIAR Climate science informs ten development programs/policies of regional bodies, national governments, humanitarian and development institutions, steering US$500 million of investments to build farmers' climate resilience.
Developing adaptation instruments to inform policy and institutional development	Developing instruments to support policy implementation; identifying gaps, models, and tradeoffs to stimulate policy coherence; exploring systems-thinking, including addressing risks of (synchronous) crop-failures; and influencing and shaping investments (e.g. building pipelines of bankable-projects) to unlock private and public finance.	By 2024, CGIAR climate science directly shapes fourteen national and/or regional policy decisions on climate resilience.
Promoting multi-scale governance to empower decision making by farmers and communities	The focus will be on institutional change and articulation in multi-scale governance, appropriate investment models, and information and data resources that actors can use in bottom-up processes to test the robustness of alternative technologies, livelihood trajectories, and investments under futures with dynamically changing climatic and hydrological uncertainties and unknowns.	By 2024, ClimBeR's scaling partners (see 12.3) in each of the six target countries are using ClimBeR's innovations to empower farmers to make decisions leading to increased resilience with a focus on increasing the agency of women, youth, and other marginalized groups.

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Impact Area Contributions

Nutrition, health & food security	By reducing the impact of variable weather and extreme events in vulnerable populations, our actions will increase the number of people in the six pilot countries and wider regions directly benefiting from CGIAR innovations that directly target improved food security and enhanced nutrition and health.
Poverty reduction, livelihoods & jobs	ClimBeR will enable exiting poverty by enhancing farmers' livelihoods through overcoming risk as a barrier to adoption of socio-technical innovation bundles, access to credit, and development of value chains. The climate-security work will generate long-lasting co-benefits in terms of reducing poverty, improving livelihoods, and creating jobs.
Gender equality, youth & social inclusion	The creation of gender-responsive digital services to reduce the impact of variable weather and extreme climate events will improve access to information for women and youth as well as for marginalized groups, thus increasing their agency. National-level action on systemic-risk will emphasize gender- and socially-inclusive scaling-mechanisms.
Climate adaptation & greenhouse gas reduction	By 2030, ClimBeR will develop the enabling environment to support a cohort of drivers of climate-adaptation interventions, at the magnitude and speed necessary to achieve rapid and broad transformation. Thirteen policies and adaptation plans will show evidence of implementation via investments worth US$900 million, reaching seven million beneficiaries.
Environmental health & biodiversity	WP3 will advance nature-based solutions as economically viable climate-resilience options, resulting in improved land management and restoration of deforested land. Policy decisions will promote environmental health and biodiversity as a means to achieving climate-resilience.

Impact on SDGs

Regions

Global	Central and West Asia and North Africa (CWANA), East and Southern Africa (ESA), Latin America and the Caribbean (LAC), South East Asia and the Pacific (SEA), West and Central Africa (WCA)

Countries

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Innovations

A Climate-Risk-Profiling-System that combines data sources and analytical approaches to identify key agricultural risks and risk mitigation solutions tailored to value-chain, geographical, and agro-ecological contexts. The system includes geospatial and other types of information (e.g. hazards, exposure, adaptation solutions, investment credit scoring) to inform policy-makers, investors, and development programing.

A financial-product, embedding within its structure an insurance-protection, which, when triggered, offsets loan payments due to the lender; combined with a digital Measurement, Reporting and Verification (MRV)-advisory-toolkit (to understand climate impacts for farmers, aggregate their data into an interoperable data wallet, and share it with stakeholders of their choosing).

A framework to increase food and nutrition security of the most vulnerable households living in climate-fragile areas, to establish a shock-responsive approach for eArly Warning to eARly action and early financE (AWARE) to strengthen the humanitarian-development-climate-security nexus. AWARE will be built on a cloud-environment using Artificial-Intelligence technologies.

An integrated assessment framework to develop policy pathways that can enable and prime the environment for climate-resilience futures. By using participatory scenario workshops, task forces, and integration workshops we will be able to translate idealized modeling into real-world policy and vice-versa, to accomplish integration of climate-resilience measures into policies.

An 'Africa Climate Security Crisis' observatory that monitors, assesses and forecasts climate-security risks across the Sahel, North Africa, Eastern and Horn of Africa and Southern-Africa. This tool will go beyond predicting conflict in order to inform policy, programing and investments of national and international stakeholders along the humanitarian-development climate-security nexus.

Key Partners

Demand	Government	Ministries of Agriculture, Environment, Health and Finance
	International NGO	United Nations Security Council
		World Food Program
	Other Public Sector	National Disaster Management Organizations and Meteorological Departments
	Private Sector	Asset managers in the field of development investments
Innovation	Academic, Training and Research	National Agricultural Research Systems
		Universities and Research Institutes
	International NGO	Digital Green
	Private Sector	Insurance and Reinsurance Companies
		Technology Companies
Scaling	International NGO	Humanitarian Aid Organizations
		United Nations Security Council
		World Food Program
	Multilateral	Multilateral Banks
	Private Sector	AgTech Companies

ClimBeR: theory of change

Challenge

- **Lack of a systemic approach to build climate resilience:** Lack of a transdisciplinary and multi-systems' approach to address the complex challenge of building resilience against climate variability and extremes

- **Limited farmer empowerment and adaptive capacity:** Lack of multi-scale governance so that empowered farmers can enhance their resilience in the face of radical climate uncertainty

- **Rate of change not sufficient to meet climate challenges:** Adoption of climate resilience socio-technical innovation bundles has lagged behind rapid shifts and tipping points in system productivity under climate variability and extremes

Demand partners

- International NGOs
- Ministries of Agriculture, Environment, Health and Finance
- Asset Managers in the Field of Development Investment
- National Disaster Management Organizations
- Meteorological Departments

Work Packages

- **Reducing risk in production system-linked livelihoods and value chains at scale:** Climate-informed knowledge-exchange and risk management services

- **Building production-system resilience through considering the inter-linked relation between climate, security and peace:** By leveraging CGIAR's land, water, and food systems science

- **Developing adaptation instruments to inform policy and institutional development:** Tools for policy and institutional reforms for transformational change

- **Promoting multi-scale governance to empower decision making by farmers and communities:** Articulation, investment models and information and data

Innovation partners

- International NGOs (e.g. Digital Green)
- Universities and Research Institutes
- NARs
- Technology Companies
- Insurance and Reinsurance Companies

Outputs

- **Climate-Risk-Profiling-System** to identify risks & mitigation solutions

- **Financial product** linking insurance with digital Measurement, Reporting and Verification (MRV) toolkit to measure/offset on-farm climate impacts

- **eArly Warning to eARly action and early financE (AWARE) Framework** to increase food and nutrition security of vulnerable households

- **Integrated assessment framework** for climate-resilient policy pathways

- **Establishment of an Africa Climate Security Crisis observatory** to monitor & forecast climate security risks

Scaling partners

- International NGOs (WFP, UN Security Council)
- Multilateral Banks
- AgTech Companies
- Humanitarian Aid Organizations
- One CGIAR Regional Integrated and other relavant Initiatives

Outcomes

- Digital-enabled bundled climate knowledge-exchange services developed by ClimBeR are being used by at least 3 digital service providers in each target country

- Regional bodies, national governments, humanitarian and development partners are using CGIAR Climate science to inform 10 programs/policies, steering US$500 million investments

- Policy advisors and makers use CGIAR Climate science to directly shape 14 national or regional policy decisions on climate resilience

- ClimBeR's scaling partners are using ClimBeR's innovations to empower farmers to make decisions leading to increased resilience

Demand Partners

- Aforementioned demand, innovation and scaling partners
- Partners working with other One CGIAR Initiatives

Impact areas

- Nutrition, health and food security: By reducing the impact of variable weather and extreme events in vulnerable populations

- Poverty reduction, livelihoods and jobs: By enhancing farmers' livelihoods through overcoming risk

- Gender equality, youth and social inclusion: By improving access to climate information for women, youth and marginalized groups

- Climate adaptation: By benefitting 7 million people via climate-adapted investments worth more than US$900 million

- Environmental health and biodiversity: By improving land management and restoration of deforested land

2022   2024   2030

sphere of control

sphere of influence

sphere of interest

SUSTAINABLE DEVELOPMENT GOALS