Global Strategy for Resilient Drylands

CGIAR 2030 Global Strategy for Resilient Drylands

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The Consultative Group for International Agricultural Research (CGIAR) is the world's largest publicly-funded group of agri-food systems research centers. CGIAR is a global research partnership for a food-secure future, dedicated to transforming food, land, and water systems in a climate crisis. It has more than 9,000 staff working in over 80 countries alongside more than 3,000 partners.

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Foreword

On behalf of **the International Center for Agricultural Research in the Dry Areas (ICARDA)** and **the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)**, and all the **CGIAR Centers** that contributed to its development, we are pleased to present the **CGIAR 2030 Global Strategy for Resilient Drylands**. This strategy is both timely and critical, addressing the pressing challenges faced by global drylands and their food systems, particularly in the face of the defining issue of our era - climate change. Tragically, its impacts are felt most profoundly in regions least equipped to handle them, especially in Africa and Asia. Home to approximately three billion people, these regions rely heavily on agriculture for their sustenance and livelihoods and its failure would signal an existential threat to humanity. This strategy takes a practical and targeted approach to uphold our shared commitment to advocating for those who are voiceless, whether due to their circumstances or having been disenfranchised by systemic barriers.

It underscores the interconnectedness and vital importance of several key areas to achieve sustainable transformation in dryland regions. By creating climate-optimized farming and diversified agrifood systems, we ensure resilience and productivity. Conserving and utilizing biodiversity, and the effective management of soil, land, and water resources are essential for strengthening both community and ecosystem resilience while ensuring sustainable production. By working together and ensuring access to sustainable, diverse, and healthy diets we are helping to alleviate hunger and malnutrition, and by translating evidence-based approaches into supporting gender and social inclusion policies, innovations, and capacity building we can drive impactful development in support of the Sustainable Development Goals (SDGs).

ICARDA, ICRISAT and all **CGIAR Centers** are proud to leverage their **fifty-year** legacy of dryland innovation for this endeavor, working in close collaboration with our national and global development partners. Together, we are confident that our collective efforts will pave the way for a brighter, more resilient future for dryland regions and their communities.

CGIAR's 2030 Global Strategy for Resilient Drylands showcases our commitment to innovative solutions for sustainable livelihoods of smallholders in the face of climate change.

We recommend the CGIAR 2030 Global Strategy for Resilient Drylands to you and your partners.

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Executive Summary

CGIAR is dedicated to creating a world where sustainable and resilient agrifood systems provide safe, healthy, and affordable diets, improve livelihoods, and ensure greater social equality while keeping within environmentally sustainable boundaries[1]. Transforming dryland food, land, and water systems in a climate crisis through science and innovation is crucial for achieving this mission.

Drylands cover 46% of the world's land[2], are home to around 38% of the global population, and support nearly 44% of the world's agricultural systems, including half of its livestock[3]. The drylands - already challenging areas for predictable food production - face mounting pressures from extreme climate change and variability, water scarcity, land degradation, and loss of biodiversity and ecosystem services that support agrifood systems. Our efforts must keep pace with these challenges, for the sake of the current drylands, and for the areas that may turn into drylands in the future as the impacts of climate change become ever more evident.

The CGIAR 2030 Global Strategy for Resilient Drylands has been developed to align with the 2030 CGIAR Research and Innovation Strategy. It presents the informed and coordinated approach that CGIAR will take to contribute to the sustainable and resilient transformation of dryland agrifood systems, building on our unique value proposition and track record of co-creating and co-delivering innovative research and impact in the drylands. It also aligns with the United Nations Convention to Combat Desertification (UNCCD), the United Nations Convention on Biological Diversity (UNCBD), and the United Nations Framework Convention on Climate Change (UNFCCC).

This strategy was developed through extensive consultations with stakeholders across CGIAR and our partner network, informed by research and a foresight study on future global dryland scenarios. This process brought together expertise across CGIAR Centers, our partners, countries, and disciplines to build consensus on the opportunities and challenges to realizing our vision. As a result, five key opportunities for dryland transformation and investment were prioritized: (1) optimized agrifood systems to adapt to climate change; (2) conserving and using biodiversity to support resilient ecosystems and communities; (3) managing soil, land, and water systems to sustainably intensify production; (4) ensuring access to sustainable, healthy diets to alleviate hunger and malnutrition; and (5) promoting inclusive, equitable development to nurture safety, agency, and peace.

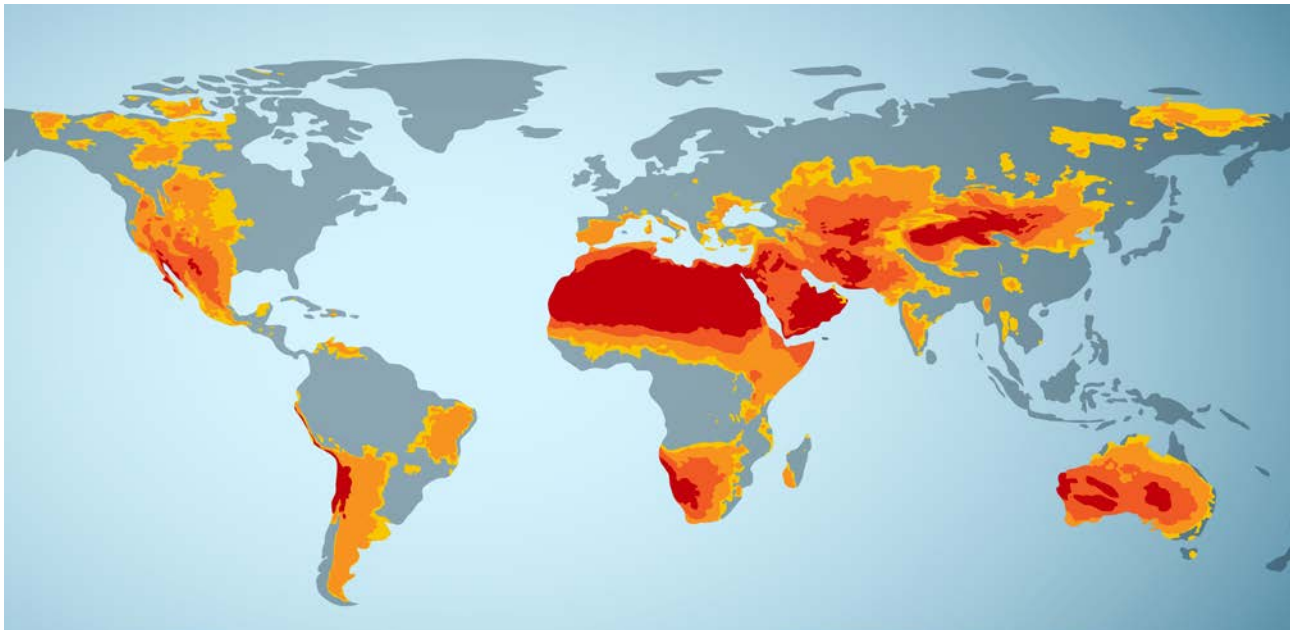
Underpinning these opportunities are our cross-cutting approaches to ensuring gender equality, youth, and social inclusion; developing innovation; scaling pathways; working in fragile and conflict-affected areas; and building partnerships and undertaking advocacy. Through a coordinated systems approach, we will pool our capacity and expertise, including through our diverse network of partners, to move beyond incremental change and towards structural transformation for dryland communities.

The commitment and engagement of everyone involved in the consultation process underscores our shared vision of ensuring a thriving and resilient future for the millions of farmers, fishers, pastoralists, agro-pastoralists, value chain actors, and communities who depend on the drylands for their food and livelihood security.

1. Global Drylands: Introduction

1.1 What and where are drylands

Drylands are areas classified as dry sub-humid, semi-arid, arid, and hyper-arid where the rate of evaporation far exceeds the amount of precipitation received (Figure 1)[4]. They cover 46.2% of the earth's surface, predominantly located in Asia and Africa[2], and can be further classified as forests or other wooded lands (28%), grasslands/rangelands (25%), croplands (14%), inland water bodies (1%), and built-up urban areas (1%)[5]. Nearly 44% of the world's agricultural systems, including half of its livestock, are found in the drylands[3]. Around 3 billion people, 38% of the global population, live in the drylands, with the vast majority in developing countries where the rates of multidimensional poverty, including malnutrition[6], are significantly higher than in non-dryland areas[2].



1.2 Dryland Challenges

Drylands are on the frontline of the climate emergency which is driving the interconnected food, land, and water crises. Agricultural productivity in drylands is typically constrained by varying degrees of water deficit and the extreme unpredictability of rainfall[3], which are expected to worsen due to rising temperatures and reduced rainfall as a result of climate change, as well as land use developments and changes in land cover. Land degradation, such as soil erosion, salinization, and loss of organic carbon, is a significant issue, particularly where forests, woodlands, and grasslands/rangelands have been converted to cultivated systems and have experienced overgrazing, inappropriate irrigation, and excessive firewood collection[1,2]. Desertification – land degradation that occurs in the drylands - affects around 20-35% of drylands[7] and is hard to repair because the rate of soil formation in the drylands is so slow. This environmental degradation and resulting loss of agricultural productivity, compounded by climate shocks, contribute to hunger, fragility, conflict, and forced migration. Notably, 70% of the world's hungry people live in areas affected by conflict[8]. At least 30% of the world's cultivated crops originated in drylands, including important globally important staples such as wheat, barley, millets, sorghum, lentil, chickpea, olives, and many fruit trees, along with their crop wild relatives[11].

The functional diversity of invertebrates and microorganisms such as cyanobacteria, fungi, lichens, mosses, and plants contribute to essential ecosystem services such as nutrient cycling, soil formation and conservation, and rainfall water regulation through the landscape. However, biodiversity in the drylands is under significant threat from a range of many interconnected drivers[3,9,10].

Rural dryland communities, whose livelihoods are predominantly based on agriculture, depend heavily on functional local ecosystems and ecosystem services for their food and livelihood security[4,11]. Over time, they have developed traditional management and behavioral strategies to maintain and replenish sparse natural resources and manage risk caused by extremely variable conditions[2,3,4,8]. However, these traditional agroecological practices and indigenous knowledge are increasingly at risk of being lost due to economic, societal, environmental, and climatic pressures.

Climate change is disproportionately impacting drylands. The surface warming of 1.2°C to 1.3°C in the drylands has been 20-40% higher than that of the humid non-drylands (0.8°C to 1.0°C). Under "average" global warming scenarios of 1.5°C and 2°C, regional warming in the drylands is projected to be around 3°C, and 3.2°C to 4°C, respectively. This excessive warming in the drylands exposes communities and ecosystems to climate shocks such as deadly heatwaves that cause loss of life, persistent heat stress, severe water shortages, yield losses, and the loss of biodiversity and ecosystem services[7,12,13]. The combined effects of climate change and desertification act as a multiplier, exacerbating risks and threats and limiting the ability of dryland communities to adapt.[2,14]

FACTS & FIGURES

1 in 3	70%	20-35%	700M	44%
of the global population lives in drylands	of dryland livelihoods require natural resources	of drylands are degraded	people may be displaced by 2030 due to water scarcity	of global food systems are located in drylands

2. CGIAR's Offer to Transform Dryland Agrifood Systems

The CGIAR 2030 Global Strategy for Resilient Drylands identifies five key opportunities for targeted investment in dryland agrifood systems, based on extensive research, stakeholder consultations, and strategic foresight analysis:

- Optimizing agrifood systems to adapt to climate change.
- Conserving and using biodiversity to support resilient ecosystems and communities.
- Managing soil, land and water systems to sustainably intensify production.
- Ensuring access to sustainable healthy diets to alleviate hunger and malnutrition.
- Promoting inclusive, equitable development to nurture safety, agency and peace.

To achieve this transformational agenda for food, land, water, and social systems in the drylands, CGIAR and its partners will co-design innovations that deliver impact, enhance synergies, and minimize trade-offs between system components. Building on our 50-year legacy of research and innovation in the drylands, we will work together in an integrated and holistic manner to implement this strategy, tailoring our approach to the unique circumstances of each environment to contribute to resilient drylands.

2.1 Optimizing agrifood systems to adapt to climate change

CGIAR aims to strengthen the resilience of dryland communities to survive and thrive amidst current and future climate change scenarios. We will achieve this by co-developing technological, institutional, and policy solutions that integrate our research and innovations with indigenous and local knowledge. These tailored solutions will support communities to adapt to climate change, reduce greenhouse gas emissions from agrifood systems, and prevent further desertification.

Focus areas will include:

1. **Co-designing climate-optimized dryland and desert farming systems**
   - Developing rainfed and irrigated systems to maximize productivity, resilience, sustainability, and livelihoods.
   - Deploying regenerative and conservation agriculture, precision agriculture, sustainable rangeland management, and integrated crop-livestock and agriculture-aquaculture systems.
   - Promoting peaceful collaboration and social cohesion among different social groups.
2. **Diversifying food production systems**
   - Integrating dryland-adapted crop, forage, tree, livestock breeds and fish into production systems, and their best management practices, to increase farm-level resilience.
3. **Developing and deploying new crop varieties**
   - Introducing improved crop varieties developed by CGIAR breeding programs, supported by community seed banks and functional, socially-inclusive, seed systems.

4. **Breeding critical food and forage crops**
   - Prioritizing the breeding of critical food and forage crops such as wheat, rice, barley, lentil, chickpea, faba bean, pearl millet, finger millet, minor millets, sorghum, pigeon pea, cowpea, groundnut, soybean, sweet potato, cactus, sulla, common vetch, and various tree species to boost yields, adaptation, and resilience while maintaining nutritional quality. Many of these crops are dual-purpose and thrive in hot and dry conditions.
   - Accelerating the breeding process by reducing cycle length and using advanced breeding tools such as genomic selection and gene editing.
5. **Supporting climate adaptation in livestock and aquatic systems**
   - Incorporating integrated agriculture-aquaculture approaches, community-based breeding programs, and genetic improvements of livestock and fish, where appropriate.

   - Working with various CGIAR livestock including buffalo, cow, sheep, goat, camel, donkey, chicken, and various fish and aquatic species.
   - Promoting the conservation of indigenous breeds and looking for valuable traits in locally adapted animals to integrate into breeding pipelines.
6. **Developing livestock feed technologies**
   - Promoting indigenous fodder species and using feedstocks that reduce methane emissions from livestock.
   - Co-creating animal husbandry innovations with livestock keepers and nomadic and transboundary communities such as livestock shelters to reduce heat stress and offer animal health solutions.

7. **Implementing participatory, local-level planning**
   - Adopting participatory rangeland management, joint community land-use planning, and the use of multi-stakeholder networks and platforms.
   - Supporting locally-led adaptation through farmer adaptation pioneers, particularly female champions on agriculture and food system transformations.
8. **Facilitating water management innovations**
   - Promoting traditional and new innovations like in-situ water conservation and water harvesting.
   - Preparing for droughts and floods through effective water management strategies.
   - Supporting youth and women's entrepreneurship towards inclusive and gender-transformative water management technologies and innovation
9. **Developing climate risk profiles, decision support systems, and early warning systems**
   - Creating socially inclusive and accessible systems and tools for informed early action that involve historical data, and real-time local-level monitoring of water, pasture and other resources.
   - Forecasts to support informed monitoring, preparedness, and adaptation strategies.
   - Fostering women's and youth leadership in shaping, developing, and accessing climate risk profiles and information systems.

2.2 Conserving and using biodiversity to support resilient ecosystems and communities

Drylands are home to a wealth of biodiversity that is uniquely adapted to the conditions and essential for ecosystem health. CGIAR will work closely with dryland communities to restore degraded environments and implement ecological food production approaches that integrate and benefit biodiversity.

Focus areas will include:

1. **Promoting crop and land use diversification**
   - Promoting mixed cropping systems to integrate indigenous species and varieties of crops such as dual-purpose sorghum, fonio, upland rice, and millets, forages, livestock, fish, fruit, nut, and other trees.
   - Encouraging farming system diversification through agroforestry, forestry, and livestock pasture integration.
   - Capacity sharing in conservation and regenerative agriculture, and agroecological approaches.
2. **Incentivizing the conservation and use of biodiversity**
   - Building on local and particularly women's knowledge and expertise on biodiversity, to strengthen the economic competitiveness of underutilized indigenous crops by investing in diversified value chains.

3. **Encouraging agroforestry practices**
   - Restoring indigenous species to stabilize soil and regulate water flows, provide shelter and shade for people and animals, and offering additional benefits such as fruit, wood, and habitat for wild biodiversity.
4. **Investing in science and technologies**
   - Investing in science and technologies to deepen our understanding of biodiversity dynamics in sustainable and resilient agrifood production systems, as well as the impacts of biodiversity loss and associated environmental degradation.
   - Investing in inclusive knowledge generation and citizen science.

5. **Maintaining and restoring indigenous biodiversity**
   - Maintaining and restoring indigenous biodiversity that is integral to ecosystems and cultural landscapes like bacteria, fungi, insects, indigenous species of forage, crops, fruits, nuts, herbs, shrubs, and trees.
6. **Empowering dryland communities**
   - Empowering communities to implement agroecological and nature-positive approaches and restore ecosystems and services that have been damaged during conflict.
7. **Collecting and conserving indigenous crops and varieties**
   - Prioritizing the conservation of indigenous crops and varieties in genebanks and repatriating genetic resources to communities where they have been lost.
   - Building capacity to establish, manage, and maintain community seed banks and seed systems.
8. **Developing Payment for Ecosystem Services schemes**
   - Creating nature credits and carbon credits that protect ecosystem services generated through diversified, climate-resilient production approaches.

2.3 Managing soil, land, and water systems to sustainably intensify production

As pressure on soil, land, and freshwater resources intensifies, the sustainable management of natural capital is crucial for building resilience and maintaining the productivity of dryland agrifood systems. Sustainable land management can bridge yield gaps, support communities to adapt to climate change and reduce land degradation. Additionally, it can reduce greenhouse gas emissions from agrifood systems by conserving soils and plant life that are carbon sinks.

Focus areas will include:

1. **Co-developing and promoting regenerative agriculture**
   - Implementing Conservation Agriculture (CA), Regenerative Agriculture (RA), and Agroecological (AE) approaches.
   - Utilizing crop diversification, drought-tolerant varieties, and no-tillage practices.
   - Promoting continuous soil cover using cover crops, mulch, or crop rotation of winter and summer crops.
   - Incorporating biological nutrient sources and organic amendments.
   - Tailoring approaches to local conditions, considering genetics, management, and environmental factors, to optimize yield within environmentally sustainable boundaries.
2. **Increasing efficiencies in sustainable water management**
   - Promoting gender-sensitive water system transformations driven by women as critical water managers.

   - Prioritizing maintaining productivity, especially during periods of water scarcity.
   - Implementing innovations and technologies such as traditional rainwater and surface water harvesting and storage, groundwater management, wastewater treatment and reuse for agriculture, and the integrated use of rainwater, surface water, and groundwater.
   - Exploring water distillation, desalination, and improved irrigation techniques.
   - Supporting sectors like water, food, and energy to minimize water wastage and maximize availability.
   - Promoting crop diversification to cultivate varieties that require less water and are capable of withstanding climatic stresses like extreme heat, drought, and soil salinity.
3. **Promoting soil health practices**
   - Promoting practices that help farmers conserve and regenerate soil, reduce erosion, build drought resilience, improve nutrient use and uptake, and suppress soil-borne diseases.
4. **Facilitating rangeland governance and restoration**
   - Supporting pastoralist communities in incorporating traditional approaches into rangeland governance and restoration to regulate grazing and allow fallow periods and re-vegetation.
   - Providing knowledge, tools, drought-resistant indigenous forage species, and support for local governance.
5. **Deploying green energy solutions**
   - Introducing solar-powered agrivoltaics where agriculture and solar energy generators can coexist on the same land to power irrigation and other farm operations.

   - Deploying desalination technologies such as electrodialysis, ultra-low energy drip irrigation, atmospheric water generation, hydroponics, and root zone cooling for controlled environment agriculture.
   - Building capacity for inclusive technology access and application.
6. **Investing in transboundary research and resource management**
   - Investing in research, infrastructure, technologies, and peace-positive management and policy approaches to mitigate conflicts arising from tensions over scarce natural resources.
7. **Considering the nexus of water, energy, food, and environment (WEFE)**
   - Conducting trade-off analyses at community, sub-national, national, and regional levels to address the nexus of water, energy, food, and the environment.

2.4 Ensuring access to sustainable, healthy diets to alleviate hunger and malnutrition

Ensuring year-round access to diverse, affordable, and nutritious diets can help address the triple burden of malnutrition prevalent across drylands, especially those affected by fragility and conflict. Achieving this goal requires a systems approach that integrates nutrition-sensitive cropping, livestock, aquaculture, and agroforestry systems. Supportive policies, market incentives, and nutrition education programs are essential to facilitate access to and incentivize the adoption of diverse, healthy diets.

Focus areas will include:

1. **Promoting nutrient-dense diverse crops and animal-sourced foods**
   - Increasing diversity of crop and animal-sourced food at the community level within production systems and markets.
   - Focusing on nutrient-dense crops such as millets, sorghum, pulses, legumes, roots, tubers, fruits, nuts, seeds, and leaves and animal-sourced foods from livestock and fish.
   - Supporting these efforts through breeding programs that aim to maintain or increase the nutritional quality and bioavailability of foods.

2. **Encouraging shifts in household-level dietary patterns**
   - Implementing nutrition education programs, awareness campaigns, market interventions, institutional support, and policy incentives.
   - Focusing on improving dietary habits, with and for pregnant women and their infants.

3. **Creating an enabling environment for the private sector**
   - Incentivizing and supporting entrepreneurship, with a particular focus on youth- and women-led startups, micro-, small-, and medium-sized enterprises (MSMEs), and farmer-producer organizations.
   - Promoting the development of healthy, value-added food products for rural and urban consumers.
4. **Partnering with humanitarian agencies**
   - Supporting humanitarian agencies to mitigate the vulnerability of people in fragile and conflict-affected areas, including internally displaced persons and refugees, by scaling up emergency food aid programs.
   - Promoting nutrient-rich foods and CGIAR genetic innovations to improve the resilience of dryland communities against climate change, fragility, conflict, and other risks affecting life, life-supporting services, and livelihoods.

2.5 Promoting inclusive, equitable development to nurture safety, agency, and peace

Addressing structural inequalities by systematically translating research into socially inclusive policy and practice at every level of societal organization is essential to facilitate the transformation of dryland agrifood systems.

Focus areas will include:

1. **Co-designing inclusive innovations, policies, and practices**
   - Collaborating with partners at all levels of society to foster sustainable development and positive peace in the drylands.
   - Focusing on land tenure systems, governance of communal resources, and access to markets and technologies, as well as structural inequalities in agricultural systems.
   - Advocating for policies that support new, inclusive employment opportunities, particularly for women, youth, underrepresented and marginalized groups.

2. **Developing climate-based conflict management systems**
   - Conducting local policy dialogues on resource use.
   - Building enhanced science and local evidence on the interrelationships between climate change and peace in food, land, and water systems.
3. **Capturing evidence for informed decision-making**
   - Facilitating strategies for creating conducive environments.
   - Maximizing the adoption and beneficial impacts of technologies at scale.
4. **Maximizing social benefits and minimizing systemic risks**
   - Ensuring promoted policies, practices, and innovations do not have unintended negative consequences for women, youth, underrepresented or marginalized groups.
   - Ensuring equitable access to resources and benefits for all stakeholders, especially women, youth, underrepresented and marginalized groups.
5. **Facilitating inclusive community access to financial and insurance services**
   - Including Loss and Damage, voluntary carbon markets, payment for ecosystem services, crop insurance, climate change risk insurance, and gender-sensitive and inclusive climate finance.
6. **Evaluating the impact of policies on community welfare**
   - Analyzing national policies such as subsidies, taxation, and import and export regulations to assess their effect on the welfare of communities at multiple levels.
7. **Advocating for sustainable livestock management**
   - Supporting local, national, and regional policies for sustainable grazing management by livestock keepers.

8. **Addressing bottlenecks in sustainable land management practices**
   - Developing policy approaches to overcome barriers in adopting and scaling sustainable land management practices, including land tenure insecurity, lack of access to financial services and publicly available information, inadequate agricultural advisory and extension services, incentives, transport, and market access.
   - Developing gender-sensitive research, policy and practice solutions that recognize and address the different barriers men and women face in accessing resources, knowledge, and services.
9. **Facilitating national strategies and policies implementation**
   - Assisting national partners in achieving Land Degradation Neutrality targets, drought smart strategies, drought risk management plans, National Biodiversity Strategies and Action Plans (NBSAPs), and Nationally Determined Contributions (NDCs) in compliance with the three Rio Conventions.
10. **Collaborating on the release of improved crop varieties and livestock breeds**
    - Working with governments and NARES on national and regional policies and procedures to ensure the efficient release and dissemination of improved crop varieties, livestock breeds, and fish.

3. CGIAR Ways of Working

CGIAR will build on the extensive groundwork laid by CGIAR Centers, governments, national research organizations, civil society partners, and the private sector working in dryland agrifood systems over the past 50 years. Collaboration and engagement with dryland communities will ensure that our scientific research-based and co-designed, co-experimented, and co-developed social, economic, policy, institutional, and technological innovations and capacity-building initiatives are tailored to meet the unique demands of the situations. The partnership will enable us to seize existing and new opportunities while addressing challenges in the drylands through a holistic and integrated manner.

3.1 Gender equality, youth and social inclusion

CGIAR is committed to closing the gender gap in access to economic resources, ownership, and control over land and natural resources for women, and to creating rewarding employment and entrepreneurship opportunities for youth living and working in food, land, and water systems in the drylands[1]. We will work closely with dryland communities to complement their indigenous and local knowledge and technologies with our co-created research and innovations, empowering them as drivers of resilience and sustainability. Improving the lives and livelihoods of women, youth, underrepresented and marginalized groups such as internally displaced and refugee persons is vital for achieving equitable, productive, resilient, and sustainable agrifood systems. CGIAR will prioritize approaches that are socially and structurally transformative for gender, youth, underrepresented and marginalized groups.

3.2 Innovation scaling for impact

Investing in modern digital tools, big data, and advanced monitoring technologies is necessary for assessing soil health, forecasting yields, and understanding climate impacts in dryland agrifood systems. These tools help to develop resilient, climate-smart solutions that ensure sufficient production and yields while staying within local, regional, and planetary boundaries. Improving access to innovations is key to the success of our investments across each of the opportunities outlined in this strategy. Scaling technology-driven business models that incorporate climate-smart automation will reduce labor, increase market linkages, and mitigate land degradation and greenhouse gas emissions, while simultaneously improving energy efficiency and profitability. CGIAR will undertake activity, output and outcome monitoring, reflection learning, and robust impact assessment of the implemented interventions.

3.3 Fragile and conflict-affected areas

Working in the drylands often involves working in fragile and conflict-affected regions and countries. By strengthening the resilience of food, land, and water systems, promoting effective governance, and empowering women, youth, underrepresented and marginalized communities, we aim to address the vulnerabilities of these systems and the complex triggers of tensions and conflicts. In doing so, we can contribute to the lasting transformation of dryland agrifood systems towards stability, peace, and prosperity.

3.4 Partnerships and Advocacy

Implementing the CGIAR 2030 Global Strategy for Resilient Drylands will require a unified global effort, involving CGIAR, governments, ministries, National Agricultural Research & Extension Services (NARES), academic institutions, global policy bodies, international organizations and humanitarian agencies, private companies, and civil society, underpinned by purposeful advocacy. Effective partnerships create opportunities to co-create solutions, leverage synergies, share assets and resources, and create space for new and diverse voices to emerge and exchange knowledge. Partnerships built on trust, shared visions, and common goals are vital to achieving the planetary and human well-being that we seek in the drylands[15]. Purposeful advocacy creates the enabling conditions for knowledge and evidence to inform and influence impactful policy, investments, and practices, and opens spaces for dialogue and innovation. CGIAR will work closely with dryland communities to co-create research, innovations, policy, and capacity that empower them to withstand ongoing shocks and stresses in their food, land, and water systems, and facilitate their role as drivers of resilience and sustainability.

4. Achieving impact at scale

We anticipate that our network of Centers and partners implementing the CGIAR 2030 Global Strategy for Resilient Drylands across dryland countries could achieve the following impacts at scale by 2030.

CGIAR Impact Area	Global Strategy for Resilient Drylands 2030 Target	Indicator
 **Nutrition, Health, and Food Security (NHFS)**	By 2030, end hunger for all and enable affordable healthy diets for 700 million people in the drylands who do not currently have access to safe and nutritious food, through scaling of climate-smart, nutrient-rich, and high-yielding crop varieties and animal breeds.	Number of people benefiting from CGIAR innovations that enhance regular access to safe and nutritious food.
 **Poverty Reduction, Livelihoods, and Jobs (PRLJ)**	By 2030, lift at least 70 million people living in rural dryland areas above the extreme poverty line of US $2.15 per day (2017 PPP) by increasing the productivity of dryland farming systems and creating equitable job opportunities in innovative dryland farming and associated value chains.	Number of people assisted to exit poverty.
 **Gender Equality, Youth, and Social Inclusion (GEYSI)**	By 2030, offer rewardable opportunities to 80 million young people in the drylands who are not in employment, education, or training, through increased participation in innovative dryland farming-associated value chains and capacity building.	Number of youths benefiting from innovations.
	By 2030, close the gender gap in rights to economic resources, access to ownership and control over land and natural resources for 160 million women who work in food, land, and water systems in the drylands, through gender transformative research, policy discourse, and innovations.	Number of women benefiting from gender transformative innovations.
 **Climate Adaptation and Mitigation (CAM)**	By 2030, contribute to the reduction of greenhouse gas emissions, and enhance resilience to the vagaries of climate change by equipping 70 million small-scale producers in the drylands with climate-smart innovations.	Number of people benefiting from climate-smart innovations.
 **Environmental Health and Biodiversity (EHB)**	By 2030, contribute towards the restoration of degraded ecosystems in the drylands by bringing 16 million hectares of land to more sustainable use, through improved pastoral & agro-silvo-pastoral land management and governance approaches, and integrated ecosystem management models.	Area of land under improved management.
	By 2030, contribute to ex-situ conservation of cereals, food legumes, and their wild relatives, as well as forage and rangeland species in the drylands, by safely duplicating 11,000 accessions in the genebanks.	Number of plant genetic accessions available and safely duplicated.
	By 2030, contribute to the sustainable use of water for agriculture in the drylands by increasing economic water use efficiency by 50 percent, through climate-proofing water-for-agriculture infrastructure, use of alternative water resources, and climate-smart mechanization.	Percent change in economic water use efficiency.

5. Conclusion

The 2030 Global Strategy for Resilient Drylands sets out how we will leverage key opportunities to drive transformative change, despite the formidable challenges faced in the global drylands. We have identified five key opportunities for investment in agri-food research and innovation that hold significant promise for catalyzing transformation including through optimizing agrifood systems to adapt to climate change; conserving and using biodiversity to support resilient ecosystems and communities; managing soil, land, and water systems to sustainably intensify production; ensuring access to sustainable, healthy diets to alleviate hunger and malnutrition; and promoting inclusive, equitable development to nurture safety, agency, and peace.

This strategy emphasizes integrating indigenous and local knowledge with the latest advances in technology and research approaches to ensure that our research and innovations meet local needs, will be widely adopted, and be accessible and affordable to all members of dryland communities.

The CGIAR 2030 Global Strategy for Resilient Drylands tackles pressing issues such as water scarcity, land degradation, and desertification, offering crucial support to dryland communities amidst climate change.

CGIAR, in partnership with a diverse range of partners, is dedicated to supporting dryland communities to improve their resilience and well-being through the systematic, holistic approach outlined in this strategy. Recognizing the indispensable role dryland regions play in the global food system, CGIAR reaffirms its unwavering commitment to supporting dryland communities to thrive.

CGIAR 2030 Global Strategy for Resilient Drylands

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