



United Nations
Convention to Combat
Desertification

REDEFINING THE DESERT

Lessons from the partnership
between Africa's Great Green Wall
and DeserTech in the Negev



Foreword

Desertification is one of the most pressing environmental challenges of our time, threatening ecosystems, livelihoods and food security across the globe. Nowhere is this crisis more evident than in Africa's Sahel region where communities are at the forefront of the devastating effects of land degradation and climate change.

In response, the collaboration between Africa's Great Green Wall (GGW) and Israel's DeserTech, facilitated by the UNCCD Global Mechanism, has emerged as a model of resilience, innovation and transformative action. This partnership proves that by empowering local communities, embracing low-tech solutions, fostering entrepreneurship and building multi-stakeholder collaborations, it is possible to restore degraded land and create a resilient future in the most arid regions.

The lessons from this partnership reveal the power of integrating traditional knowledge and time-honored practices with cutting-edge innovation, proving that small-holder farmers and local actors can lead transformative change. By showcasing projects that holistically tackle challenges such as water scarcity, food insecurity and economic instability, this report underscores the importance of scalable, community-driven solutions.

The GGW and DeserTech partnership offers not just hope for the Sahel but a roadmap for tackling land degradation and desertification worldwide. We hope that these insights inspire new collaborations, future innovations and impactful actions to restore the planet's most vulnerable landscapes.

INTRODUCTION 4

LESSON 1 6
Environmental stewardship starts with empowered local communities

LESSON 2 8
Low-tech solutions deliver big impacts against desertification

LESSON 3 10
Integrated solutions are vital for tackling complex challenges

LESSON 4 12
Resilience relies on sustainable land management

14 LESSON 5
Innovative business models fuel entrepreneurship

15 LESSON 6
Collaboration and partnerships drive knowledge sharing

16 CHALLENGES & OPPORTUNITIES

18 RECOMMENDATIONS AND WAY FORWARD

Contents

Introduction



Desertification and its impact on the environment, food security and communities

Desertification poses a critical challenge to millions of lives and livelihoods across the globe. Nowhere is this crisis more acute than in the Sahel region of Africa, a vast expanse of arid land stretching across the northern part of the continent. The encroaching desert, pushed forward by climate change and unsustainable land practices, is ravaging ecosystems and exacerbating food shortages. To answer this challenge, the collaboration between the Great Green Wall (GGW) and DeserTech, facilitated by the Global Mechanism (GM) of the UNCCD, has offered innovative solutions with the potential for lasting impact.

GM's focus on fostering innovation through technology transfer

The Global Mechanism (GM) of the UNCCD, in partnership with the African Union's GGW Accelerator (GGWA), engaged with DeserTech, an innovation ecosystem in Israel's Negev desert. Together, they work to identify

the causes and challenges associated with desertification, as well as potential solutions that use low-cost technology and innovative business models.

Partnership between GGW and DeserTech

Launched in 2007, the GGW is an ambitious initiative led by the African Union to restore land, combat desertification and improve lives in the Sahel. DeserTech complements this vision by empowering local actors to become innovation leaders, leveraging technology to resolve their desertification-related challenges.

This dynamic partnership unites governments, academic and research organizations, private sector, NGOs, and local communities across ten Sahelian countries: Djibouti, Ethiopia, Sudan, Chad, Niger, Nigeria, Mali, Burkina Faso, Mauritania and Senegal. Recognizing the complex nature of drivers and processes, this collaboration integrates sustainable land management, innovation and community empowerment.



Collaboration process: Goals, structure and outcomes

The GGW and DeserTech partnership showcases a compelling model for tackling desertification and building a sustainable future in arid regions. It demonstrates the potential to restore land, improve livelihoods and mitigate the effects of climate change.

The resulting pilot project brought together entrepreneurs from the GGW countries and the Negev region. During capacity-building workshops, they assessed needs, evaluated technologies and innovations, and developed project proposals for the DeserTech Marketplace. The results of these ongoing projects are now being presented to potential investors for long-term project viability.

KEY MILESTONES ALONG THIS JOURNEY BETWEEN JANUARY AND MAY 2023 INCLUDED:

71 specific challenges identified through a needs-assessment process were showcased in the online DeserTech Marketplace.

7 selected challenges were addressed during the Negev seminar

17 project proposals resulted from the above, with several GGW countries collaborating to address shared challenges using DeserTech solutions

This partnership highlights the power of bringing together diverse stakeholders and combining traditional knowledge with innovative technology to drive sustainable solutions. The lessons learned from this partnership will undoubtedly inform and inspire similar efforts to combat desertification worldwide.





Lesson 1

ENVIRONMENTAL STEWARDSHIP STARTS WITH EMPOWERED LOCAL COMMUNITIES

The GGW and DeserTech collaboration is based on the fundamental principle of co-creating solutions together with local communities through capacity- and leadership building, with a special emphasis on women's role in environmental stewardship.

Recognizing that sustainable solutions must be rooted in local knowledge, ownership and leadership, this collaboration began with capacity building via seven online training sessions between December 2022 and February 2023, culminating in an immersive in-person learning experience in the Negev desert.

This impactful training program was facilitated by the UNCCD Global Mechanism and conducted by DeserTech for 30 environmental entrepreneurs from the Great Green Wall countries, with 23 per cent women leaders in agribusiness.

Pilot programmes that demonstrate the power of local communities include:

LAND RESTORATION IN BURKINA FASO, DJIBOUTI, NIGER AND CHAD:

This ambitious project – in partnership with Netafim, an Israeli manufacturer of irrigation equipment – focuses on restoring 400 hectares of degraded land through sustainable utilization of groundwater.

By engaging local farmers' organizations, cooperatives and rural associations, the project ensures that restoration practices are tailored to the specific needs and challenges of each community. Over the four years of its pilot implementation, the project aims to:

- 🌱 Increase agricultural productivity and **improve livelihoods**
- 🌱 **Reduce soil erosion** and water runoff and improve soil quality
- 🌱 Improve the local **biodiversity**
- 🌱 Increase carbon sequestration
- 🌱 Improve quality of life for nearly **20,000 direct beneficiaries** in these four countries (mainly rural women organized in cooperatives), and about **80,000 indirect beneficiaries** (the households of the targeted women). This project will also create **4000 jobs** around land restoration by increasing the value of land.

CLEAN ENERGY THROUGH SOLAR-POWERED SOLUTIONS:

Several GGW projects across the Sahel, including those in Chad, Mali, Niger and Nigeria, have harnessed solar energy to power cold rooms for food preservation, and water pumps for irrigation and access to clean water. These projects combine local practices with modern technology to reduce post-harvest loss and improve agricultural production, generate income and improve nutrition for families in land-locked countries such as Chad.

Involving local communities in the installation and maintenance of these solar-powered cold rooms, water pumps and storage tanks fosters local technical skills and self-sufficiency, ensuring the long-term viability of the solutions.

The success of these pilot programs can be witnessed through the increase in farming, fishing and dairy productivity in the region thanks to improved farm incomes. The solar-powered water storage systems especially benefit women and girls who are otherwise tasked with walking long distances to gather water for their families.



Lesson 2

LOW-TECH SOLUTIONS DELIVER BIG IMPACTS AGAINST DESERTIFICATION

Technology can be a powerful driver of change, but real transformation begins when communities come together to harness tech solutions to solve real-world problems. The GGW and DeserTech collaboration proves that simple technologies can effectively harness traditional knowledge and local tools to advance climate adaptation and community resilience.

For example, the cost of providing access to clean water for **135,000 people in Chad** can fit within **\$5.5 million budget** when done through a **four-year project** to install and maintain groundwater pumps and

storage tanks for clean water, powered by solar, the most affordable energy source in human history.

Undertaken as a partnership between high-performing local NGOs – Future Team Chad, LEAD Chad, and Innovation Africa – together with an Israeli NGO having demonstrated performance in driving clean water access in several African countries, the project proves that effective collaboration is key to harnessing the potential of simple technologies to achieve results at scale.



The power of digital connectivity tools in the fight against desertification

One of the key components of the successful partnership between the GM, GGW and eserTech is frequent monitoring and adaptation to real-life challenges. For example, what is the strategy to help local communities trust and adopt the clean water solutions introduced by the project?

The answer lies in a simple SIM card installed in the community's solar-powered water pumps that identifies the source and capacity of groundwater aquifers from which the water is extracted. The community receives an early alert in case of a system fail and can take pre-emptive action by coordinating with the project managers.

The use of **smartphones and tablets** to build a sustainable agricultural value chain in Ethiopia, and the use of a **cloud-based system** to identify and combat bushfires in Senegal are other examples of the potential of smartphone-based technology in fighting desertification in the Sahel. Read more about these solutions on page 12.



Lesson 3

INTEGRATED SOLUTIONS ARE VITAL FOR TACKLING COMPLEX CHALLENGES

Desertification is a complex crisis, closely linked to poverty, food shortages, unsustainable farming practices, water scarcity and various socioeconomic challenges. Effectively addressing this issue demands integrated approaches that recognize the interdependence of these problems and provide holistic solutions.

Building Senegal's competitiveness in West Africa's date palm industry

The date farming industry in Senegal has faced persistent challenges, including frequent water scarcity and plant diseases that threaten young date palm trees.



By partnering with Israeli irrigation experts Netafim, Senegalese date farmers have now adopted an integrated farming approach that includes planting water-absorbing vegetable species that are also commercially viable.

This innovative approach not only serves as biocontrol for pests and conserves water but boosts farmers' incomes. Utilizing autonomous, smart precision irrigation technology, the project improves the productivity and competitiveness of Senegal's date palm farmers, paving the way for a thriving industry.

A living green wall to combat desertification

Imagine a 250-hectare bio-fortress, built with three layers of plant species and designed to shield against the relentless advance of desertification. This innovative project, located within the GGW corridor of Mali and Nigeria, leverages cross-sector collaboration between agroforestry, microbiology and bio-stimulation to restore indigenous flora and fauna in the region.

This integrated business model combines soil health improvement, plant nurseries, research and development, education, land restoration, and agricultural product revenue generation to establish buffer zones that double as economic and educational hubs.

Developed as a pilot project by research institutes in Africa and Israel, this bio-fortress aims to slow desertification, alleviate food shortages, create jobs, expand research opportunities and promote regenerative agriculture and land restoration.



Image used for representation only

Lesson 4

RESILIENCE RELIES ON SUSTAINABLE LAND MANAGEMENT



Key outcomes expected from this 24-month ongoing project include:

- ✔ Mapping forest and vegetation types using **remote sensing**
- ✔ Developing data sets with historical forest fires through **satellite imagery**
- ✔ Documenting the SaaS-based DSS with an integrated **pre-fire risk model**
- ✔ Achieving 25 per cent completion of **planned fire management activities within 12 months** of finalizing the fire management plan
- ✔ Providing fire prevention education to **20 per cent of the population** in Goudiry within 12 months
- ✔ **Reducing fire events by 15 per cent** within the first year

This innovative approach combines advanced technology with community engagement to address bushfire risks effectively.

Flood risk mitigation through smart water management

A partnership between climate-monitoring agencies in Niger and Nigeria, alongside Climate-Eyes has led to the development of a pilot flood risk assessment model with integrated water management solutions.

Safeguarding farmers with small dams

Water scarcity and unpredictable rainfall present significant challenges to the people of Niger and Nigeria, severely hindering agricultural development.

While local communities traditionally collect rainwater from tributaries, they lack the tools to harness the large volumes of flood water available each year. This limitation contributes to land degradation, soil erosion and food insecurity.

This pilot project aims to address these challenges by implementing rainwater harvesting systems and constructing small dams in creeks and reducing flooding and soil degradation. Supported by a cloud-based monitoring system, the initiative will empower government agencies and stakeholders to strategically plan and build these hydrological structures using local resources and a trained workforce.

This innovative approach combines traditional practices with modern technology to protect livelihoods, enhance agricultural productivity and build resilience against climate variability.

Desertification often triggers extreme weather events, such as wildfires and floods, that inflict severe and lasting damage on vulnerable communities. The collaboration between GGW and DeserTech showcases how sustainable land management can build resilience against these hazards, protecting lives, livelihoods and ecosystems.



Bushfire alerts via mobile devices

A collaboration between Senegal's Centre de Suivi Ecologique (Ecological Monitoring Center) and Climate-Eyes, a startup specializing in satellite-based remote-sensing technologies, has launched a project to mitigate bush savanna fires. The initiative focuses on developing a spatial fire risk assessment model through a cloud-based Decision Support System (DSS).

The DSS empowers stakeholders to better understand pre-fire risks, prepare for potential fires and enhance their firefighting capabilities.



Lesson 5

INNOVATIVE BUSINESS MODELS FUEL ENTREPRENEURSHIP

The Global Mechanism of UNCCD facilitated the DeserTech Innovation Leaders program with support from the German and Austrian governments, the Israel Innovation Institute and the Merage Foundation. This initiative integrated local intelligence from the GGW participants with the proven success of Israeli startups showcased through the DeserTech Marketplace, a leading innovation ecosystem managed by the Israel Innovation Institute.

Key components of the programme

The programme offered a combination of included intensive online training, hands-on workshops – including an in-person session at the Negev Research Center and a grant-writing workshop – and continuous mentorship. Participants were given a platform to present their solutions on the dedicated DeserTech Marketplace.

Participants dived deep into mapping, identifying and prioritizing the most pressing challenges posed by desertification and drought. A week-long visit in Israel's Negev desert allowed them to exchange ideas with DeserTech ecosystem, explore innovative practices and technologies, and collaborate with local entrepreneurs and experts. Together, they assessed technology needs and discussed collaboration opportunities for joint implementation of solutions tailored to their communities.

Building on proven climate impact models

The GGW and DeserTech partnership builds upon the success of two impactful models:

- ✔ The GGW in the Sahel – 17 years of impact:
 - a. **20 million hectares** of land restored
 - b. **350,000 jobs** created
 - c. **USD 90 million** in revenue generated
- ✔ The DeserTech Marketplace
 - a. **A cutting-edge** initiative by the Israel-based DeserTech Innovation Community
 - b. **It develops and markets technologies** that enable sustainable living in arid climates.
 - c. **It serves as a hub for startups**, research institutions, and organizations addressing challenges in agriculture, water, energy and infrastructure.

The DeserTech community is a joint initiative by the Merage Foundation Israel, the Israel Innovation Institute, the Ministry of Environmental Protection, and Ben Gurion University.

This partnership demonstrates how innovative business models and cross-sector collaborations can drive sustainable development and entrepreneurship in arid regions.



The GGW and DeserTech partnership model at a glance

- 10 COUNTRIES** in the Sahel desert
- 30 AFRICAN ENTREPRENEURS** from the GGW Accelerator
- 23 PER CENT WOMEN LEADERS** among participants
- 15 INSTITUTIONS** including government agencies, NGOs and startups
- 10 SUPPORTING PARTNERS** from Israel with robust agribusiness expertise in the Negev desert

06 MONTHS of immersive learning and mentorship

ONE STRONG PARTNERSHIP driving innovation

Lesson 6

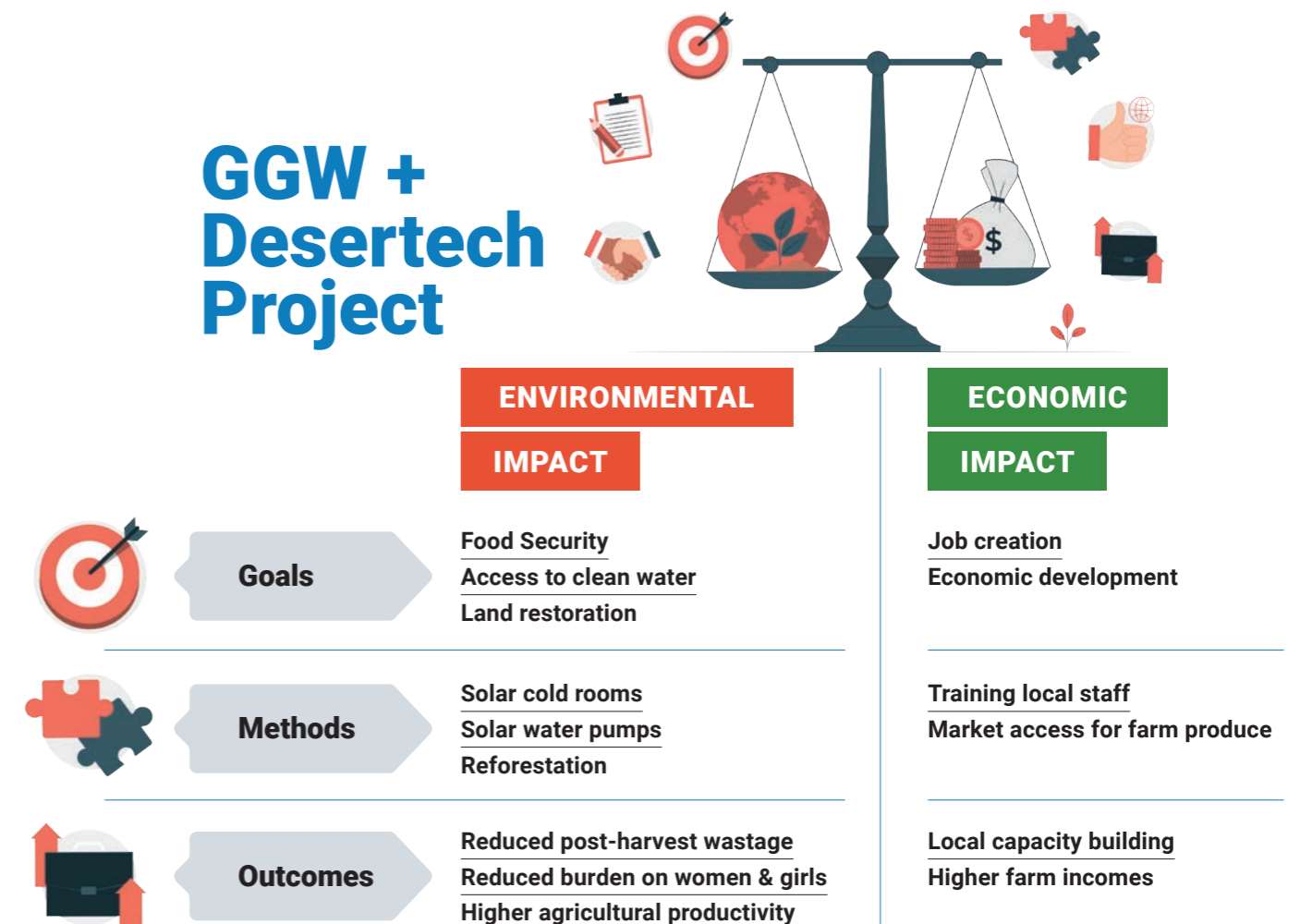
COLLABORATION AND PARTNERSHIPS DRIVE KNOWLEDGE SHARING

The collaboration between GGW and DeserTech represents a robust multi-stakeholder partnership involving governments, NGOs, research institutes, international organizations and the private sector from the Sahelian countries and Israel. Facilitated by the Global Mechanism of UNCCD, this partnership is grounded trust and mutual respect, leveraging shared resources and expertise to achieve long-term impact.

A cornerstone of this partnership is its network-based model, where shared goals and processes are co-created by all the stakeholders, ensuring inclusivity and alignment across diverse sectors.



GGW + Desertech Project



Challenges & Opportunities

BREAKING BARRIERS, SEIZING OPPORTUNITIES

The GGW and DeserTech partnership emphasises the critical role of community involvement. Each project prioritizes empowering small-holder farmers, actively involving them in decision-making processes, and demonstrating the transformative potential of community-driven solutions to desertification challenges.

This partnership serves as a model for leveraging innovation, collaboration and inclusiveness to address some of the most pressing environmental challenges of our time.



Challenges



1

Funding

While initial funding was generously provided by the German and Austrian governments and the Merage Foundation, sustaining the 16 projects outlined under the GGW and DeserTech partnership will require additional financing. The estimated total budget for these projects is approximately USD 60 million, emphasizing the need for greater involvement from the private sector and the global community.

Capacity building

Extensive knowledge exchange and practical training have laid the foundation for these projects, incorporating the potential of African entrepreneurs and Israeli innovation technologies. However, realising the full potential of these initiatives requires continuous capacity building within local communities, particularly in technical and project management skills such as monitoring, reporting and budgeting.

The GM prioritizes gender-responsive capacity-building, ensuring women play a central role in project planning and implementation. For example, initiatives like solar water pumps and land restoration in Burkina Faso, Djibouti, Niger and Chad have generated significant benefits for young women and girls, especially those in women-led farmers' cooperatives.

3

Policy and regulatory risks

Despite support from individual governments and multilateral organisations like the African Union and African Development Bank, implementing cross-border projects poses challenges. These include navigating complex policy and regulatory frameworks security risks from political instability, currency fluctuations and operational hurdles.

A comprehensive risk assessment is currently underway to address these concerns.



Opportunities

1

Scaling successful projects

The GGW and DeserTech partnership offers a rich array of innovative solutions that can be scaled up and replicated globally. Communities combating desertification, land degradation and drought worldwide can benefit from these approaches.

2

Technology transfer and innovation

The partnership demonstrates the transformative power of low-cost technologies, network collaboration and innovative business models in delivering tangible benefits for climate and economic resilience of local communities.

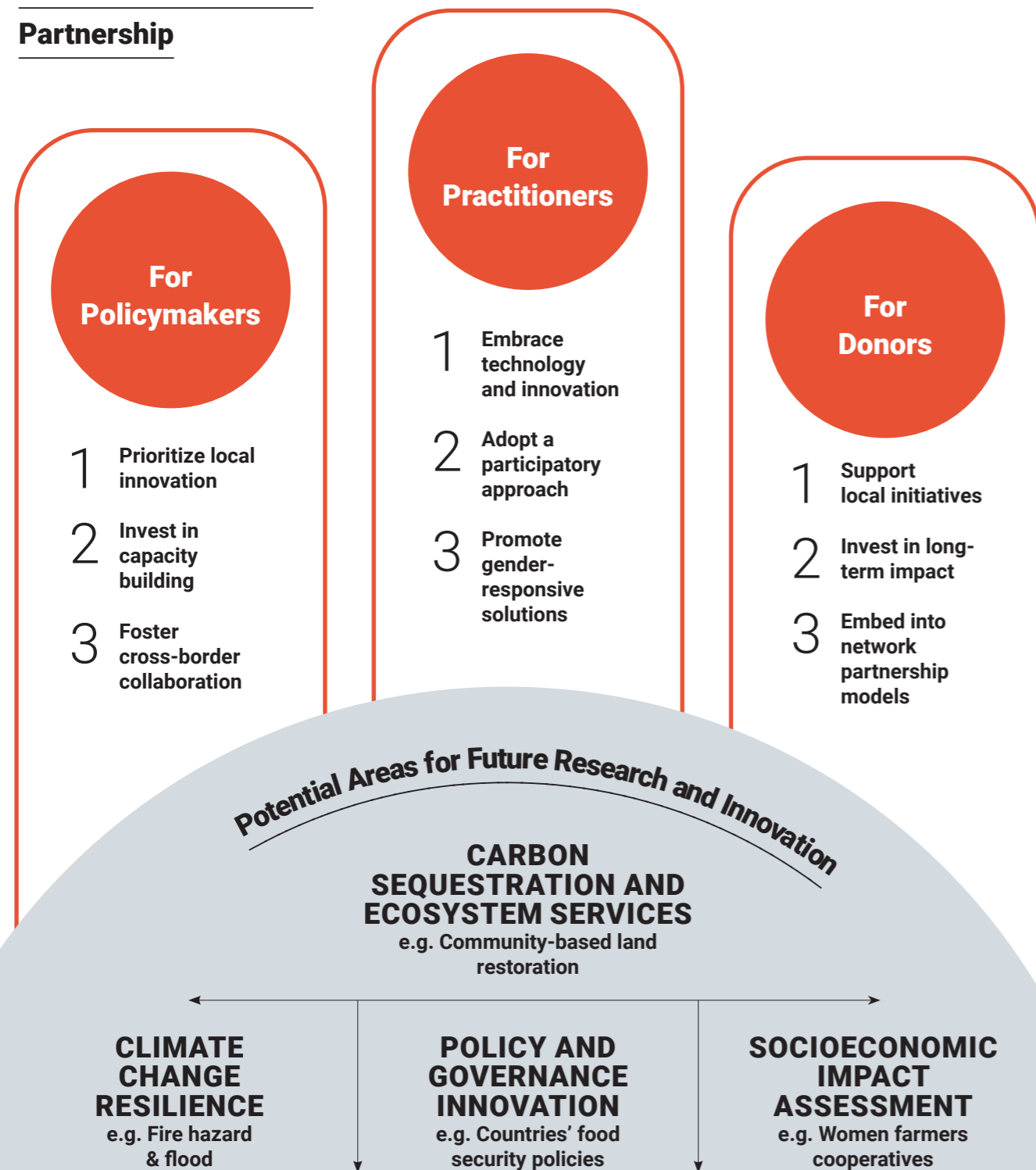
3

Strengthening community engagement

Globally, there is a growing recognition that restoring and maintaining healthy land can unlock significant opportunities for growth. These include reducing investment risks, increasing agricultural productivity, fostering economic prosperity and building more peaceful and resilient societies.

Recommendations and way forward

Key takeaways from the GGW + DeserTech Partnership



In Conclusion

**IF YOU WANT TO GO FAST, GO ALONE.
IF YOU WANT TO GO FAR, GO TOGETHER.**

– African proverb

The GGW and DeserTech technology transfer exemplifies the power of the Network Partnership Model, successfully adopted by the Global Mechanism of UNCCD since the Convention's 15th Session of the Conference of the Parties in 2022.

As of June 2024, in addition to the GGW and DeserTech partnership, this portfolio includes:

72
National Projects

24
Regional or Multi-country Projects

6
Global Projects



Calling all impact investors: Join a powerful alliance of scalable business models!

Are you a VC investor looking for high-impact opportunities? An early-stage investor searching for the next big thing in agritech or climate tech? Or a PE firm interested in long-term, scalable solutions to global challenges?

The GGW and DeserTech projects present a **unique chance to align your investment goals** with meaningful environmental and social impact. These initiatives offer **seed-round opportunities** in the high-potential GGW

region, allowing investors to support these innovative startups and entrepreneurs

By contributing to these projects, you are not just funding another sustainable business. You are investing in improved agricultural output, economic prosperity and **creative, peaceful and resilient communities in the Sahel.**

The GGW and DeserTech projects are **continuously monitored by the GM** and its partner agencies to drive impactful progress in the fight against desertification, land degradation, and drought.



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