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CTCN
UN Climate Technology Centre & Network



IMPACT REPORT

CLIMATE CHANGE AND SECURITY

INNOVATIVE COMMUNITY-BASED TECHNOLOGY FOR THOSE AT RISK
OF CONFLICT DUE TO CLIMATE CHANGE

IMPACT REPORT

Lead author and design: Eleanor Saunders
Graphic icons: Becky Hatchett
Cover photo: CTCN / Miranda Rikki Tasker / Cameroon

Technical reviewers and contributors:
Nadege Trocellier: UN CTCN, Global Adaptation Lead
Isabel Hagbrink: UN CTCN, Communication Specialist

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About CTCN:
The Climate Technology Centre and Network (CTCN) promotes accelerated, diversified and scaled-up transfer of environmentally sound technologies for climate change mitigation and adaptation, in developing countries, in line with their sustainable development priorities. Learn more at ctc-n.org.

About the Global Europe Peace, Stability and Conflict Prevention programme:
The 2021-2027 Global Europe thematic programme on Peace, Stability and Conflict Prevention (PS&CP) supports interventions that have a global or trans-regional impact and serve a dual purpose: a) providing assistance to and building capacities for conflict prevention, peacebuilding and crisis preparedness; b) addressing global, trans-regional and emerging threats.

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INTRODUCTION

“EVIDENCE SUGGESTS THAT CLIMATE VARIABILITY LEADS TO HEIGHTENED RISKS OF INTERPERSONAL AND INTERGROUP VIOLENCE. A 1°C INCREASE IN TEMPERATURE HAS BEEN FOUND TO INCREASE INTERPERSONAL VIOLENCE BY APPROXIMATELY 2%, WHILE INTERGROUP CONFLICT RISK INCREASES BY 2.5% TO 5%.”

WORLD ECONOMIC FORUM, 2025

CLIMATE CHANGE & SECURITY

The EU-funded Climate Change and Security programme (EC CC&S) tackles two interwoven challenges:

Climate change leads to instability. Unpredictable weather and increased severe events (such as cyclones, heat waves, floods and droughts) challenge humanity's way of life, particularly for those who are most vulnerable. Whilst a changing climate may not directly cause conflict, it indirectly pushes people into tension as they escape natural disasters or venture into unfamiliar lands in search of better conditions.

Insecurity decreases resilience against climate shocks. Communities already living in conflict are not well prepared for the compounding effects of natural disasters.

Thus, climate change and security are inexplicably linked, and communities face prolonged crises when the two combine. The longer a crisis lasts, the bleaker the prospects become for affected people.

Resilience against climate change helps communities to avoid conflict and reduces impacts in conflict zones. Innovation is required to find the appropriate cultural and social-economic solution that truly reduces localized climate risks.

To test new technologies in countries where up-front costs can be high and instability hampers progress, the EU-funded **Climate Change and Security programme (EC CC&S)** facilitated innovation. The programme strengthened local communities' resilience against climate change, boosted locally-led innovation, and supported security for generations to come.

In a crisis-affected country

LIFE EXPECTANCY

6 Years below the global average



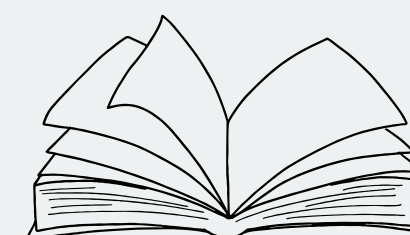
NUTRITION

25% Of people undernourished (8% globally)



EDUCATION

10% Primary school completion rates (90% globally)



MORTALITY RATES

2x Maternal mortality rates (double the global average)

[Humanitarian Action](#) data since 2011



THE EC CC&S PROGRAMME DELIVERED

10
Initiatives

200K
Up to €200k each

+ Technical assistance
for innovative
technology uptake



“Weather-related disasters displaced 43.1 million children worldwide over a 6 year period, the equivalent of around 20,000 child displacements every day, due to floods, storms, droughts and wildfires.”

UNICEF, 2023



COMPOUNDED CHALLENGES

The reality of facing compounded challenges:

Burkina Faso (UNHCR report)

Farmer Sambo Maiga once owned a wide stretch of land in the Sahel region. In 2011, the rain never came, and drought prevailed. Maiga's shea and acacia trees died, and his fields became bare. He tried to adapt, but in 2018, armed gunmen took over the village, forcing Maiga, his 2 wives, and 12 children to flee. In 2021, they were living by the city of Kongoussi in a plastic shelter provided by the UN Refugee Agency.

The EC CC&S technical assistance

Burkina Faso tested off-grid solar systems on a pay-as-you-go basis to bring affordable sustainable energy to communities who need to build afresh.



Nigeria (UN & UNHCR reports)

Farmer Bulama Buba Kadai once owned 20 farms and more than 100 head of cattle in the Northeast of Nigeria. In 2016, Boko Haram attacked his village. Kadai lost his land, cows and family. He and some 500 other farmers took refuge on the outskirts of Yola city, in Adamawa State. Some of them were temporarily allotted a small piece of land by the local government, but yields have been poor due to soil erosion and infertility.

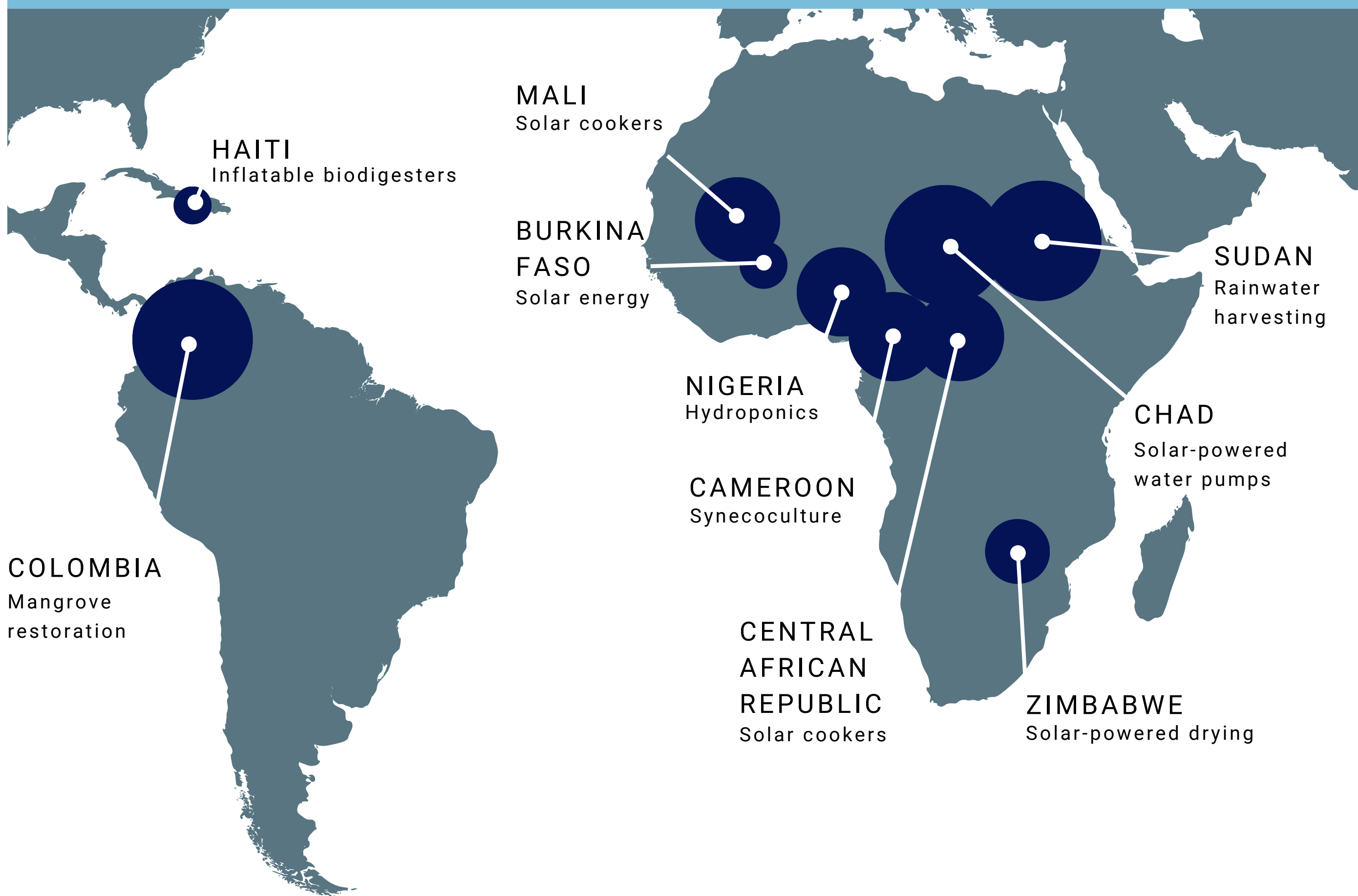
The EC CC&S technical assistance

Nigeria tested local hydroponic greenhouses on small plots to increase food production locally, regardless of soil quality and nearby security risks.



MAP OF INITIATIVES

The EC CC&S initiatives span Africa, Latin America and the Caribbean, regions where the climate and environmental crisis is inextricably linked with poverty, food insecurity and resource-based conflict and displacement.



8166 DIRECT BENEFICIARIES

515,700 INDIRECT BENEFICIARIES

63% WOMEN BENEFICIARIES

42% YOUTH BENEFICIARIES

CHALLENGES & SOLUTIONS

COUNTRY	ND-GAIN INDEX (/187)	CURRENT CONFLICTS	CLIMATE HAZARDS	EC CC&S INITIATIVE	EC CC&S TECHNOLOGY	IMPACT*
Burkina Faso	147	Terrorist insurgency	Heat, land degradation	Energy technology	Off-grid solar energy systems	2 2 2
Cameroon	161	Terrorist insurgency	Drought, land degradation	Agriculture technology	Synecoculture	1 2 6
CAR	186	Terrorist insurgency	Deforestation	Cooking appliances	Solar-powered cookers	2 1 4
Chad	187	Terrorist insurgency	Water scarcity	Water harvesting	Solar-powered water pumps	1 4 1
Colombia	93	Civil war / Drug war	Storm surges	Environment restoration	Mangrove restoration	1 1 4
Haiti	176	Civil war / Gang war	Severe weather conditions	Energy technology	Inflatable waste management tank	2 2 3
Mali	169	Terrorist insurgency	Deforestation	Cooking appliances	Solar-powered cookers	2 2 3
Nigeria	157	Terrorist insurgency	Drought, land degradation	Agriculture technology	Hydroponics	1 2 7
Sudan	184	Civil war	Water scarcity	Water harvesting	Crescent terraces	1 2 2
Zimbabwe	174	NA	Deforestation	Cooking appliances	Solar drying	2 3 5

*Impact descriptions per country can be found on pages 10 and 11.

CLIMATE 15 SECURITY 21 SAFETY 36

The [ND-GAIN Country Index](#) summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience.

The European Commission retains a non-exhaustive, regularly updated [list of conflict-affected and high-risk areas](#). Current conflicts are also recorded on the [world population database](#).

IMPACT

CLIMATE & SECURITY

5 CLIMATE MITIGATION

4 x Reduced CO2 emissions
(Burkina Faso, CAR, Mali, Zimbabwe)

1 x Reduced methane emissions
(Haiti)

10 CONSERVATION AND RESTORATION

3 x Ecosystem restoration
(Cameroon, Colombia, Haiti)

7 x Conservation of natural resources
(Burkina Faso, CAR, Chad, Mali, Nigeria, Sudan, Zimbabwe)

5 WATER SECURITY

3 x Improved water management
(Chad, Sudan, Nigeria)

2 x Improved water supply
(Chad, Sudan)

5 FOOD SECURITY

3 x Promotion of environmentally-friendly farming practices
(Cameroon, Colombia, Zimbabwe)

2 x Improved farming efficiency
(Cameroon, Nigeria)

11 ENERGY SECURITY

5 x Increased energy independence
(Burkina Faso, Chad, Haiti, Mali, Zimbabwe)

6 x Access to renewable, sustainable energy
(Burkina Faso, CAR, Chad, Haiti, Mali, Zimbabwe)





IMPACT

SAFETY

10

CONFLICT
PREVENTION

4 x Reduced resource competition
(Cameroon, Chad, Nigeria, Sudan)

6 x Conflict prevention
(Cameroon, CAR, Colombia, Mali,
Nigeria, Sudan)

10

COMMUNITY
STABILITY

7 x Empowerment of women and youth
(Burkina Faso, Cameroon, CAR, Haiti, Mali, Nigeria,
Zimbabwe)

3 x Reduced migration
(Cameroon, Colombia, Nigeria)

5

LOCAL
SAFETY

3 x Reduced travel into
conflict areas
(CAR, Mali, Zimbabwe)

2 x Access to shelter
(Nigeria, Zimbabwe)

12

ECONOMIC
STABILITY

7 x Increased enterprises and livelihoods
(Burkina Faso, Cameroon, CAR, Colombia, Haiti,
Nigeria, Zimbabwe)

5 x Stable income from well-managed
natural resources
(Cameroon, Colombia, Haiti, Nigeria, Zimbabwe)



WOMEN AND GIRLS PARTICULARLY BENEFIT FROM INCREASED SECURITY AND SAFETY THROUGH THE INITIATIVES WITH REDUCED NEED TO GO INTO CONFLICT AREAS, IMPROVED ACCESS TO RESOURCES, AND CAPACITY BUILDING.



IMPACT STORIES

“TECHNOLOGY PLAYS A FUNDAMENTAL ROLE IN GALVANIZING CLIMATE ACTION AND BUILDING A GREENER AND MORE SUSTAINABLE FUTURE. TECHNOLOGY IS ALSO A FOUNDATIONAL MEANS OF IMPLEMENTATION TO DELIVER THE UNPRECEDENTED SOCIAL AND ECONOMIC TRANSITIONS THAT ARE NEEDED TO KEEP THE GOAL OF HOLDING GLOBAL AVERAGE TEMPERATURE TO A MAXIMUM OF 1.5°C ALIVE.”

UNFCCC, 2024

NIGERIA AGRICULTURE TECHNOLOGY

The farming community in Kaduna State, northern Nigeria, faces climate change impacts of drought and desertification, coupled with the presence of violent armed groups. Farmers do not have the freedom to access their fields and have fallen into poverty and food insecurity.

The EC CC&S initiative brought a small-scale greenhouse and hydroponics system to the community. The greenhouse enables local farmers to grow vegetables with enriched water instead of soil. 60 farmers have been trained in the hydroponics system and produce food for 3,416 community members, a notable 30% of the local population.

The greenhouse offers security against increasingly dry soil conditions and provides safer working conditions. The local farmers no longer have to go into conflict regions or work unproductive fields. They can produce an abundance of food with the hydroponics system, and in the future will add a cold storage facility to avoid any waste. Stable food production in turn lowers the risk of food-related crime in a region prone to violence.



The easy-to-use hydroponics system is adaptable and scalable for community-level deployment. The collective aim is to embed hydroponic farming in Kaduna's agricultural master plan (with dedicated funding and investments), and to create incubators for youth- and women-led agribusinesses and processing units.



“WE USED TO FARM OVER THERE, FAR AWAY. THERE WERE KIDNAPPERS AND PEOPLE WERE AFRAID. NOW, WE CAN PRODUCE FOOD WITHIN THE SAFETY OF OUR COMPOUND”

HAJIYA SUWAIBA MUSA, HYDROPONICS FARMER, NIGERIA

CAMEROON AGRICULTURE TECHNOLOGY

The towns of Garoua and Figuil in Northern Cameroon face climate challenges of drought and desertification. They have approached adaptation with innovation through synecoculture.

The EC CC&S programme brought together environmental experts from across Africa to adapt synecoculture technologies from Japan to Cameroon's climate. Collectively, they documented the success and benefits experienced by local farmers who piloted the technology, and formed a valuable community of practice.

Synecoculture promotes self-sufficiency in food production and helps the farming community to reduce dependency on chemical fertilizers or pesticides, which are expensive, difficult to obtain in times of conflict, and damaging to the environment.

The farmers of Garoua and Figuil have built a rich knowledge base of sustainable farming, and shared their wisdom through videos and a Facebook group. 500 community members, primarily young people, have been trained in the new techniques.

Synecoculture is a farming method that takes advantage of the natural symbiosis of plants with different root systems to improve soil quality, heat and water flow. Plants with deeper roots pull up water to plants with shallower root systems, and taller plants shade those beneath. For example, when edible plants like fruit trees with salad crops grow together, they nurture one another, promoting local biodiversity.

It is a natural way to produce food whilst also restoring the environment.



The next step is to work closely with schools to embed synecoculture into the curriculum for students across Cameroon, thus creating a future generation of sustainable farmers.



“ALL YEAR LONG, WE HAVE GREEN, AND GREEN IS A SOURCE OF CARBON CAPTURE. WE FIGHT CLIMATE CHANGE WITH SYNECOCULTURE. IT'S MORE THAN A PHILOSOPHY; WE USE NATURE AS OUR GUIDE.”

RUTH LANGSI YELOMA, PRESIDENT, TERRE DES JEUNES

CLIMATE AND SECURITY IMPACT CAMEROON & NIGERIA

3416

COMMUNITY MEMBERS
directly benefitting in Nigeria

500

PEOPLE TRAINED
in synecoculture technologies

CLIMATE

- **Ecosystem restoration:** Synecoculture promotes biodiversity, enhancing the resilience of ecosystems against climate variability.
- **Reduced climate vulnerability:** By adopting synecoculture, farmers reduce their exposure to climate risks such as droughts and floods. Hydroponics uses significantly less water compared to traditional farming, which is crucial in arid regions.
- **Sustainable, resilient agriculture:** Synecoculture reduces the need for chemical fertilizers and pesticides, promoting environmentally-friendly farming practices. Hydroponics systems operate in controlled environments, reducing dependence on unpredictable rainfall and mitigating the impact of climate change.

SECURITY

- **Conflict prevention:** By improving agricultural productivity and food security, tensions over scarce resources such as water and land are reduced.
- **Reduced rural-urban migration:** Improved food security and livelihoods stabilize rural communities, reducing migration to urban centres.
- **Protection from violence:** Hydroponics systems shield agricultural activities from the disruptions caused by violent conflict, since greenhouses are built closer to communities.

SAFETY

- **Year-round food production:** Hydroponics allows for consistent crop production, even during droughts or erratic weather conditions.
- **Community stability:** Promotes social cohesion by involving community members in shared agricultural practices.



CAR AND MALI COOKING APPLIANCES

In the Bangui region of the Central African Republic (CAR), women and girls spend hours collecting firewood. They walk into dangerous territories, risking violence and damage to the forest ecosystem.

The EC CC&S initiative explored solar-powered cookers and heat retention baskets as an alternative to risky firewood harvests. These sun-catching ovens harness renewable energy, and the baskets require only a small amount of energy to heat up and then slow-cook for hours. The technology, manufactured locally by the University of Bangui, has open-source design plans.

Women are responsible for daily meals and are the primary users of the solar cookers. To reach them, 30 youth “solar cooking advocates” were recruited and trained by the university. The youth support community awareness among local women and help to distribute the cookers.

800 community members have benefited from the new cookers, now able to cook at home with decreased exposure to smoke, increasing local production opportunities. Manufacturing of the cookers will continue to grow and expand with an aim to reach new communities.

Looking ahead, the University of Bangui has the opportunity to develop a full master programme around cookstoves, including manufacture, maintenance and business management. In addition, students will learn how to monitor the impact of the stoves according to UNFCCC methodologies by calculating emission reduction, with potential to become auditors to control the quality of equipment available in the market.




In Banamba and Commune V of Bamako, Mali, women also travelled increasing distances into dangerous and unfamiliar territories for firewood.

Pilots in the two regions tested various solar-powered cooking devices and tailored the solutions to local households’ needs.

625 community members in Mali benefited from the new cookers, greatly reducing the impact on local forests as firewood collection is no longer required.

Going forward, the results of the pilot will guide partnerships between the public and private sectors and communities to boost supply and demand for zero-emission solar cookers.





ZIMBABWE COOKING APPLIANCES

The Gwanda Rural District in Zimbabwe piloted solar technologies with a focus on mopane worms.

The EC CC&S initiative set up a solar-powered drying facility in the village of Garanyemba near Gwanda. The facility keeps women out of the forests, where drying processes took up to three days and are now achieved safely in town in just 10 hours.

The facility is run by Lifaletu Collective, a strong, women-led community with 30 members (22 women) involved in the harvesting, drying and trading of mopane worms. Together they create jobs and new sources of revenue, increase local safety, reduce CO2 emissions, and provide food security.

When mopane worms are out of season, the women use the dryer to preserve fruits, dry meat and bake breads. It provides a year-round safe and sustainable livelihood, and the women of the Cooperative create jobs within the village, revitalizing the local economy.

In the long term, as the business model strengthens and sales increase, the facility will become a prime example of how to scale family-led production to a profitable business



Mopane worms are spikey caterpillars of the emperor moth. Consumed in rural areas across southern Africa, they are an excellent low-cost meal, high in protein and nutrients.

For generations, women trekked deep into the mopane forests to collect the worms and dry them in the bush, where firewood is plentiful. This process consumes 50,000 cubic metres of wood in a single year. The impact is deforestation, risk of forest fires, and the decline of mopane worm populations as their habitat disappears.



“OUT THERE [IN THE FOREST], SOME ARE BEING BITTEN BY SNAKES, OTHERS ARE BEING RAPED, OTHERS ARE EVEN BEING BURNT... BUT NOW, I COME HERE, I DRY MY MOPANE WORMS, NO MORE DANGERS.”

NYATHI NTOMBIZODWA, SECRETARY OF THE LIFALETHU COOPERATIVE

CLIMATE AND SECURITY IMPACT CAR, MALI, & ZIMBABWE

50K

CUBIC METRES OF WOOD
saved annually in Zimbabwe

1985

PEOPLE BENEFITTED
collectively across the
three projects

CLIMATE

- **Reduced greenhouse gas emissions:** Solar cookers reduce biomass use, reducing carbon emissions.
- **Forest conservation:** By reducing wood consumption, the projects directly contribute to forest preservation.
- **Sustainable harvesting (Zimbabwe):** Reduces overharvesting and promotes better management of mopane worm populations.

SECURITY

- **Sustainable energy source:** The projects leverage solar energy, which is renewable and available year-round.
- **Economic stability:** Stable income opportunities through solar cooker production and dried mopane worm sales reduce financial precarity.
- **Economic stability:** By reducing wood fuel dependence and increasing income opportunities, dependence on unsustainable activities such as illegal logging are reduced.

SAFETY

- **Mitigating resource-based conflicts:** By reducing competition for scarce firewood, the project will ease tensions over natural resources in rural communities.
- **Improved safety for women and girls:** With less need to travel long distances to collect firewood, women and girls are less exposed to violence or harm in unsafe areas.



“Nearly one in 11 people around the world go to bed hungry each night, a crisis driven largely by conflict, climate change, and chronic inequality This represents an increase of 152 million more people facing hunger than in 2019.”

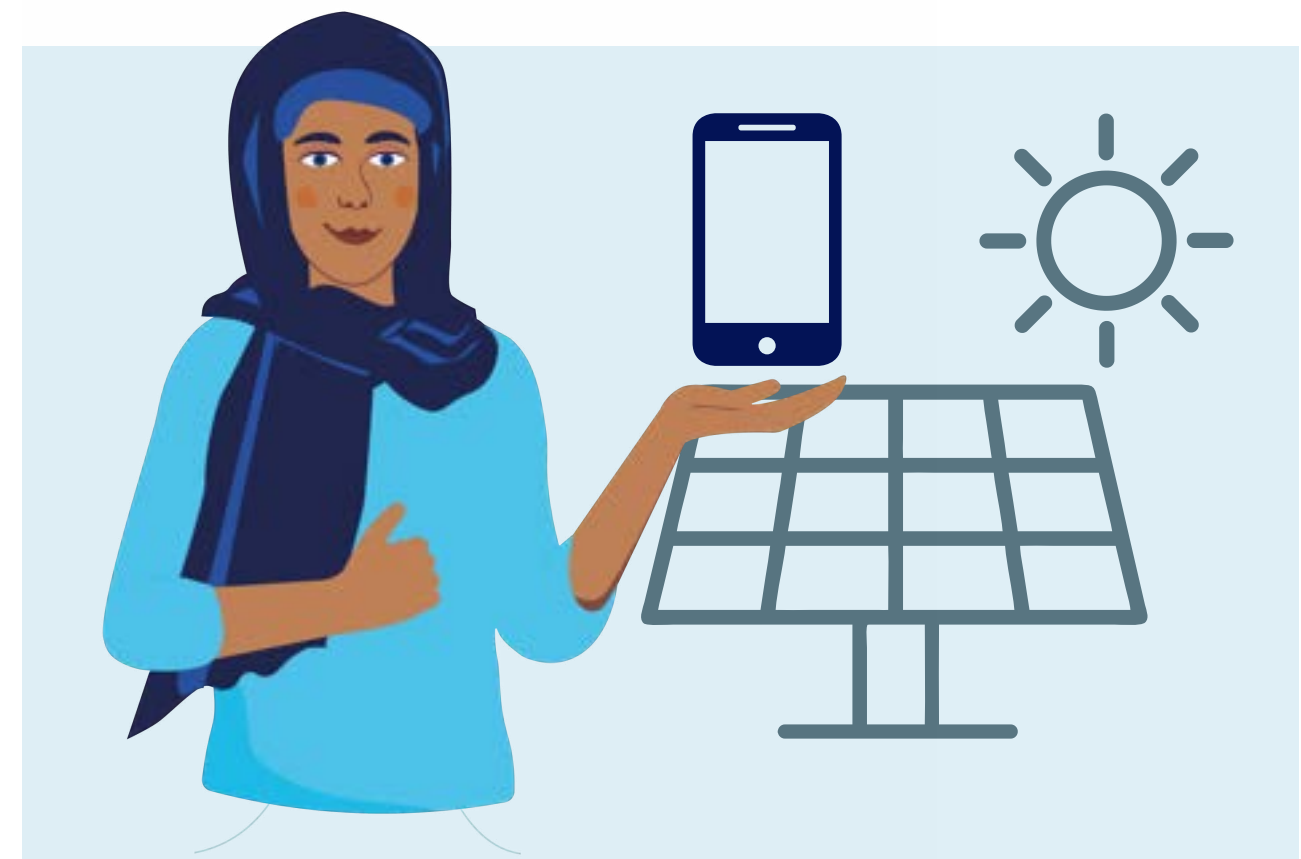
ACTION AGAINST HUNGER, 2025

BURKINA FASO ENERGY TECHNOLOGY

Burkina Faso faces a humanitarian crisis driven by insecurity amid a warming climate, drought and land degradation. Many communities lack access to essential services such as food and energy. An estimated 2.7 million people are severely food insecure across the country. [UNOCHA](#)

Sahelia Solar, a company based in Ouahigouya, specializes in solar energy systems and has set up many initiatives to reduce energy insecurity. However, they were not yet serving the vital agricultural market where costly and insecure fuels were still used.

The EC CC&S initiative supported a technical assessment of the specific energy requirements for agriculture enterprises. They assessed local micro-industry and agri-food processing SMEs, including women-led industries. Women often undertake laborious traditional food processing tasks such as pounding starches, which can be automated with a reliable energy source. The assessment found that these SMEs struggle with rising energy demands, limited renewable technologies and high costs.



The solution delivered a pay-as-you-go community solar model whereby solar energy technology could be set up and paid for on a use basis by cooperatives of SMEs. Splitting the cost across the community made solar energy an affordable reality.

60 agriculture SME community members now have access to reliable clean energy, and Sahelia Solar will continue market expansion.



HAITI

ENERGY TECHNOLOGY

The island nation of Haiti has long faced the triple challenge of environmental degradation, energy poverty and poor waste management.

The EC CC&S initiative tackled these three problems with a single solution, conducting studies that showed that biodigesters would help the Kenscoff Municipality to generate biofertilizers more efficiently and sustainably.

Inflatable biodigesters in particular were found to be the most beneficial based on the type and quantity of waste generated locally and the modularity of the inflatable units.

1,500 community members directly benefit from this study and assistance. Women typically cook in Haitian households and will be the primary users of biodigesters in the future.

The inflatable biodigester is filled with organic waste and transforms it into biogas and fertilizer.

The fertilizer is used to replenish dwindling soils damaged by climate change, and the biogas is a source of renewable energy for cooking.



The country plans to roll out more biodigesters and increase capacity through a partnership with the Association of Visionaries for Socio-Economic Development (ADVISE) to supply organic waste from across the island for transformation into biogas.



“BY TURNING ORGANIC WASTE INTO FUEL FOR COOKING AND LIGHTING, WHILE REDUCING EMISSIONS, THIS PROJECT PUTS VULNERABLE WOMEN, YOUTH AND FAMILIES AT THE HEART OF CLIMATE ACTION. IT IS A STEP TOWARDS RESILIENCE, DIGNITY AND A FUTURE WHERE OUR ENVIRONMENT IS RESTORED AND OUR PEOPLE CAN THRIVE.”

MOÏSE FILS JEAN PIERRE, MINISTER OF ENVIRONMENT OF HAITI

CLIMATE AND SECURITY IMPACT BURKINA FASO & HAITI

1560

COMMUNITY MEMBERS
collectively benefitting

60

AGRICULTURE SMEs
with access to reliable
clean energy

CLIMATE

- **Reduced greenhouse gas emissions:** Solar energy will replace diesel generators, significantly reducing CO2 emissions in the agro-industrial sector in Burkina Faso, and reducing methane emissions from organic waste while providing clean cooking fuel in Haiti.
- **Improved energy efficiency:** Supports the adoption of clean energy technologies, improving the efficiency activities while reducing environmental impacts.
- **Environmental restoration:** Reduces the pressures of deforestation in the longer term, and improves soil quality (deforestation and compost production)

SECURITY

- **Enhanced energy security:** Reduces dependence on costly diesel imports, or unsafe firewood collection, stabilizing energy availability in rural areas.
- **Community stabilization:** Access to reliable energy supports community business initiatives, reducing the trend to move away and enhancing community stability.

SAFETY

- **Empowerment of women and youth:** Providing jobs, and energy security to vulnerable community members.
- **Stable income from well-managed natural resources:** Productive waste management in Haiti transforming natural organic waste into energy and fertilizer



“Around the world, some 685 million people live without access to reliable electricity. Expanding access to clean, reliable and affordable energy has the power to transform lives: from improved access to healthcare and education, to reduced time poverty and added safety and security.”

UNOPS, 2025

CHAD WATER HARVESTING

Chad is one of the hottest countries in the world. Average annual temperatures have risen by over 0.5 degree since 1990, nearly double the global average. More than 3.6 million people lack access to water and sanitation. (UNOCHA).

The Liwa commune, north of Lake Chad, draws up water from borehole wells to use in homes and industry. These wells will run dry in a matter of years. The community faces an important decision: to move now or later, and how best to carry out further analysis in the hope of identifying other sustainable borehole sites.

The EC CC&S initiative focused on the rehabilitation of existing wells, using solar-powered pumps to sustainably draw up water. The local community then compiled a guide to responsible water usage to manage this precious resource. The guide covers drinking, farming and washing, as each use requires a different quality of water, with higher or lower volume demands.

A digital monitoring system will track consumption on each borehole. Combined with the guide, the careful management of the extracted well water means it can be treated and apportioned effectively without wasting a drop.



625 local people have directly benefited from the pump. Vulnerable populations, including women and youth, gained a voice and gained opportunities in the governance and decision-making processes that surround the technology.

The solar pump technology has the added benefit of using renewable energy and thus reduces any need for costly diesel, reduces CO2 emissions, and improves the quality of life locally and globally. Access to clean water may also create new farming opportunities, both for livestock and agriculture, and will continue to create change in these communities.



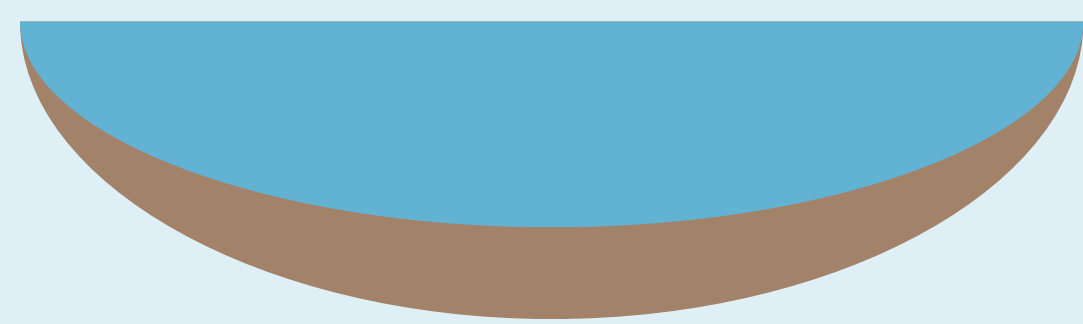
SUDAN WATER HARVESTING

Since April 2023, Sudan has faced an unprecedented humanitarian crisis driven by ongoing conflict. Nearly 9 million people are displaced internally, and an additional 3 million people have fled to neighbouring countries. It is exceptionally difficult to bring funding into the country, and support for basic needs like water is dwindling.

The EC CC&S initiative carried out an assessment of existing technologies for water harvesting, capturing those that are already embedded and thriving within local communities. The resulting water technology database serves as a key resource on the use of existing technologies and possibilities that are locally driven, adapted and appropriate to meet the challenges faced by the Sudanese.

One such technology is the crescent terrace, a crescent-shaped impression in the ground that captures water runoff. The terraces have been rolled out as a pilot project in the past year and show early success. 150 individuals have been trained, including women and youth who are most affected by water scarcity.

Crescent terraces are crescent shaped ditches. Water can flow in on the straight side with an embankment built on the rounded side to hold the water in and allow it to soak into the ground.



The database is accessible to government officials, researchers, engineers, technicians, farmers and community members to allow further rollout of pilots and community uptake. Going forward, the country intends to secure additional funding to spread this technology to other regions. A webinar with banking institutions is planned as a first step to raise awareness of the pilot and attract potential interest from donors.



CLIMATE AND SECURITY IMPACT CHAD & SUDAN

150

INDIVIDUALS TRAINED
in water harvesting techniques

775

LOCAL PEOPLE BENEFITTED
through clean water access

CLIMATE

- **Resilience against climate variability:** By improving water harvesting systems, the project helps communities cope with extreme climatic conditions, such as droughts and unpredictable rainfall.
- **Sustainable water management:** The introduction of efficient modern water harvesting technologies reduces pressure on water resources and minimizes water loss, including through reduced evaporation.
- **Improved water management:** By ensuring efficient water use, the project promotes resilience against drought and water scarcity.
- **Reduced carbon emissions:** Solar-powered pumps eliminate the need for diesel generators, significantly reducing CO2 emissions.

SECURITY

- **Reduced conflict over water resources:** By increasing water availability, the project reduces competition between different user groups, such as farmers and pastoralists, which has historically led to conflict.
- **Stabilization of rural communities:** A stable water supply mitigates migration pressures, helping prevent displacement due to scarcity.

SAFETY

- **Improved safety:** Reducing the need for long-distance travel to collect water decreases the risk of conflict and violence.
- **Supporting peacebuilding efforts:** By integrating conflict sensitivity into water management, the project contributes to long-term peace and security in the region.



“The economic cost of drought extends beyond immediate agricultural losses. It affects entire supply chains, reduces GDP, impacts livelihoods, and leads to hunger, unemployment, migration, and long-term human security challenges.”

UNCCD, 2024

COLOMBIA ENVIRONMENT RESTORATION

The municipality of Timbiquí, on the Pacific coast of Colombia, is home to a vital 8,917 hectares of protective mangrove forest. Colombia's coastal zones are exposed to increased floods due to rising seas and storm surges. Where the mangroves have been damaged through climate or human impacts, the effects of climate change are most strongly felt.

The EC CC&S initiative focused on a partnership with Cuerval Sostenible (Sustainable Cuerval) to restore the mangrove forest. Cuerval Sostenible work with adults and youth, uniting the local Afro-Colombian communities.

Together they plant mangrove seedlings in degraded areas, clear invasive plants, and reopen blocked channels so tidal waters can return. These efforts build on ancestral practices such as harvesting from one area while leaving others to recover, but are now reinforced by modern technologies including drones, satellite mapping, and community-led monitoring.



A community-based measurement, reporting, and verification system ensures that everyone takes responsibility for the restoration efforts. United, people set fair rules and monitor the forest together, turning it into common rather than contested ground. That unity makes them stronger against outside pressures and illegal exploitation. And, as restored mangroves buffer storms and erosion, they become a bedrock of peace and stability.



“THE WIND TORE THE ROOF RIGHT OFF. MY KIDS WERE SCREAMING [...]CLIMATE CHANGE IS COMING, AND WE ARE WITNESSING IT.”

YOLANDA GARCÉS ORTIZ, CLAM HARVESTER FROM CUERVAL, TIMBIQUÍ

COLOMBIA ENVIRONMENT RESTORATION

The community members involved in fishing and shellfish harvesting in Cuerval are in daily contact with the mangroves and are among those who have a high stake in keeping the mangrove ecosystem in good condition.

They developed a guide for restoration and continue to share it with as many people as possible to form a participatory mangrove restoration community along the coast.

The El Cuerval Community Council now collectively manage over 2,700 hectares of mangroves. 510 individuals are champions for the mangrove ecosystem, and their numbers are increasing.

The council share knowledge through training and leadership to support a further 1,000 people from nearby towns who benefit from the safety provided by the restored mangroves. These towns will adopt the participatory mangrove restoration model, and scale it to other coastal communities too.



“WE’RE PLANTING TREES SO THE ECOSYSTEM HOLDS UP, AND THAT’S GONNA LET US HAVE MORE MANGROVES OVER TIME FOR OUR KIDS AND FUTURE GENERATIONS. THE PROJECT HELPS BECAUSE OUR ECONOMY DEPENDS ON THE MANGROVE.”

GILMA MARINA ANGULO, EL CUERVAL COMMUNITY COUNCIL

CLIMATE AND SECURITY IMPACT COLOMBIA

2700

HECTARES OF MANGROVE
under community management

1000

PEOPLE WILL BENEFIT
from the safety of the
mangroves

CLIMATE

- **Mangrove restoration:** Restoring mangrove ecosystems enhances carbon sequestration, reducing greenhouse gas emissions.
- **Resilience against climate change:** Mangroves protect coastal areas from storm surges and sea-level rise, supporting local adaptation.
- **Ecosystem services:** Mangroves provide critical services such as protecting biodiversity, supporting fisheries, and improving water quality.

SECURITY

- **Reduced resource-driven conflict:** The project reduces tension over land and resources and fosters collaboration by promoting sustainable mangrove management and alternative livelihoods.
- **Food security:** Promotion of environmentally-friendly farming practices

SAFETY

- **Improved safety:** Restoring mangroves stabilizes the coastline, reducing environmental degradation.
- **Reduced migration:** Generating stable livelihoods and a future-proofed community.



Mangroves are among the world's most powerful carbon sinks, storing more carbon per hectare than many terrestrial forests. Protecting them helps Colombia meet its climate goals: restoring 18,000 hectares of ecosystems by 2030 and cutting emissions in line with its national commitments. They also cool the air, anchor sediments, and filter pollutants before they reach coral reefs and seagrass beds. Their reach extends far beyond Colombia's Pacific coast, sustaining biodiversity and bolstering climate resilience across both land and sea.



THE FUTURE

“SOCIETY NEEDS TO REDUCE CARBON DIOXIDE EMISSIONS BY 45 PER CENT BY 2030, WHILE CONSERVING AND RESTORING BIODIVERSITY AND MINIMIZING POLLUTION AND WASTE. THE WELL-BEING OF TODAY’S YOUTH AND FUTURE GENERATIONS DEPENDS ON AN URGENT AND CLEAR BREAK WITH CURRENT TRENDS OF ENVIRONMENTAL DECLINE.”

UNEP, 2021



LONGEVITY

All 10 EC CC&S initiatives have potential to scale and support even more communities nationally and internationally, here are some highlights:

CAMEROON

The goal is to scale up the initiative and embed synecoculture into the national curriculum for schools.

ZIMBABWE

The solar dryer is quickly becoming a successful women-led business and a multipurpose hub for drying fruits, vegetables, meat, nuts and bread.

COLOMBIA

Longevity is seen in increasing reserves of natural resources and empowerment of women.

NIGERIA

Artisans construct simple, low-cost, greenhouses and hydroponic systems to sell, creating new livelihoods. The community plans to set up a cold storage system to harvest and store excess produce.

HAITI

Collaboration with the Association of Visionaries for Socio-Economic Development (ADVISE), will use waste from across Haiti for fuel production.



“OUR WOMEN ARE REALLY SHY, AND WITH THE PROJECT, I’VE NOTICED THEY’RE MORE EXPRESSIVE, MORE CONFIDENT. THAT’S REALLY IMPORTANT, BECAUSE WE’RE THE ONES HOLDING UP THE FAMILY, THE HOME, AND OUR ECOSYSTEMS.”

GILMA MARINA ANGULO, THE EL CUERVAL COMMUNITY COUNCIL



LESSONS LEARNED

RESPONSES TO CLIMATE CHANGE SHOULD ALIGN WITH CONFLICT PREVENTION AND PEACEBUILDING ACTIONS. INVESTING IN CLIMATE ACTION IS CRITICAL IN FRAGILE AND CONFLICT-AFFECTED SETTINGS AND, IF SEIZED UPON WITH INTENTIONALITY, CAN BE A VALUABLE OPPORTUNITY TO STRENGTHEN COOPERATION, REBUILD TRUST, AND MEND THE SOCIAL FABRIC.

UNEP CLIMATE PROMISE, 2023



LESSONS LEARNED

1

PRACTICE LOCALLY LED CLIMATE ACTION

Devolve support and decision-making to the lowest possible level. Every community knows their own stressors intimately, and thus know how best to keep themselves safe.

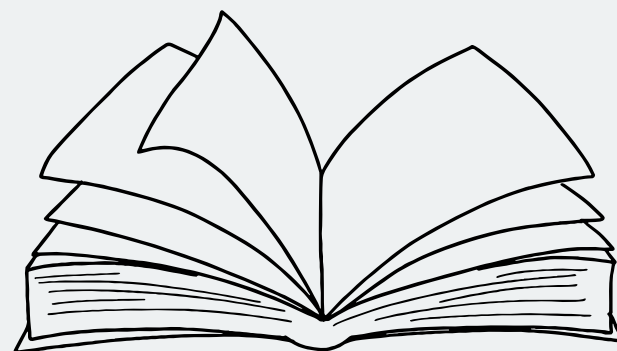


Example: Building a localized hydroponics system gave the women of Nigeria the resources they required to flourish.

2

SCALE THROUGH KNOWLEDGE SHARING AND EDUCATION

Grow skills and capacity within the community, allowing locally-led climate action to flourish and embed into the next generation

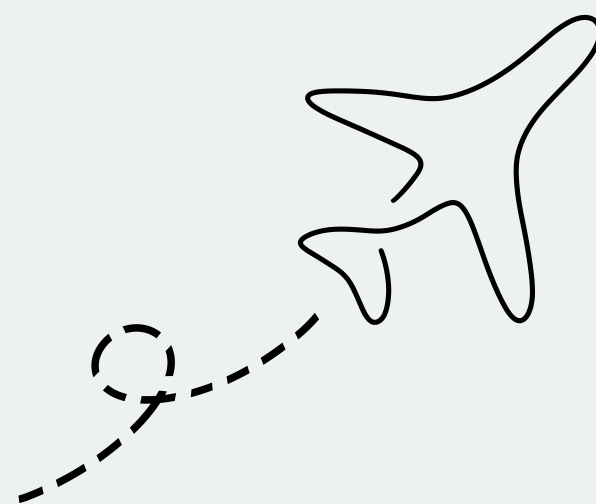


Example: Young people are leading the way in Cameroon, where they will retain sustainable agricultural skills and a relationship to the land for life.

3

PILOT APPROPRIATE TECHNOLOGIES

Test and pilot new ideas, gather data and adapt to the needs of the community. Those who are most vulnerable may need careful tailoring of a technology to their unique needs.



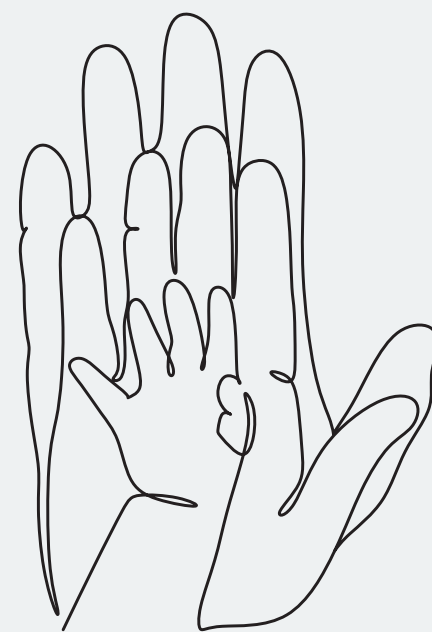
Example: Pay-as-you-go energy was not adopted in Burkina Faso until data was gathered on economically vulnerable groups, and a system was tailored to their needs.

LESSONS LEARNED

4

CREATE COMBINED WINS

Initiatives like ecosystems restoration or renewable energy build resilience against future climate impacts and support livelihoods while limiting or reducing emissions.

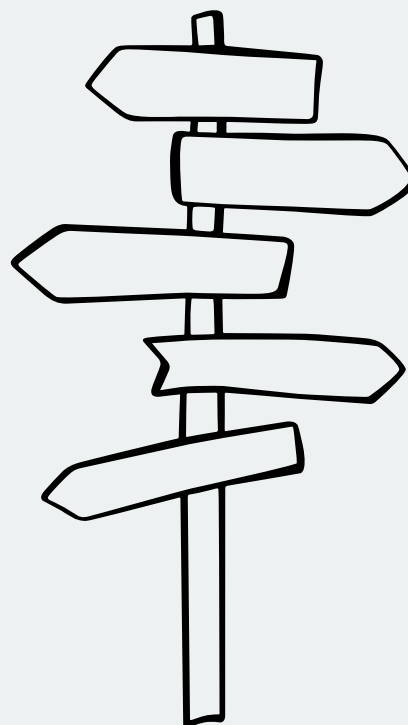


Example: Cook stoves in Mali consider both mitigation and adaptation simultaneously to create a synergistic "win-win" solution.

5

GENERATE ATTENTION

Actions that demonstrate co-benefits beyond a single objective are more attractive to funders and policymakers who support their longevity.



Example: The drying facility in Zimbabwe offers a variety of livelihood opportunities, and access to new markets.

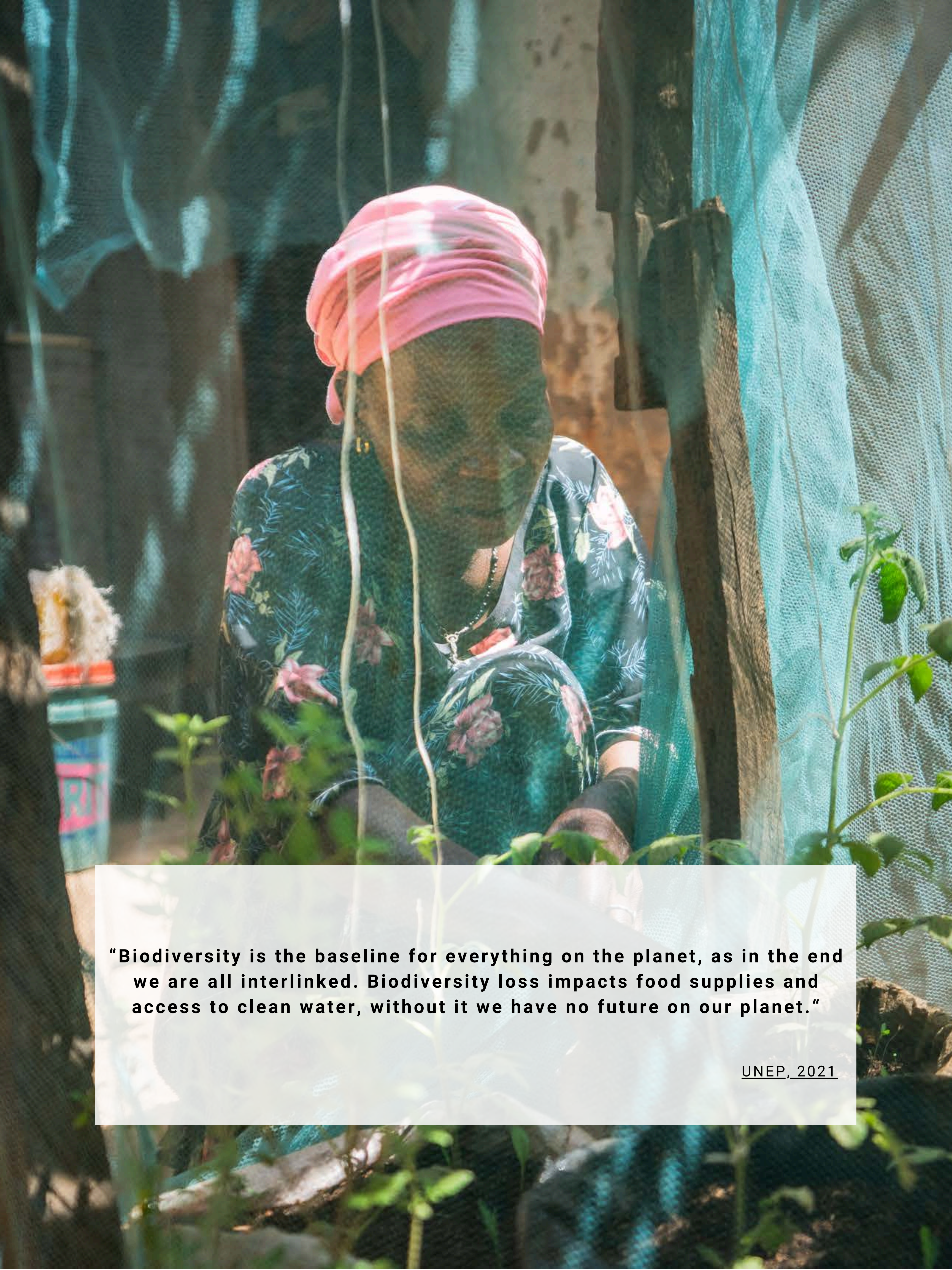
6

REBUILD ECOSYSTEMS

Functional ecosystems replenish soils, lock in water, flourish and grow. They are protective and supportive to human environments.



Example: Colombia's mangrove forests protect from extreme weather events while also providing livelihoods.



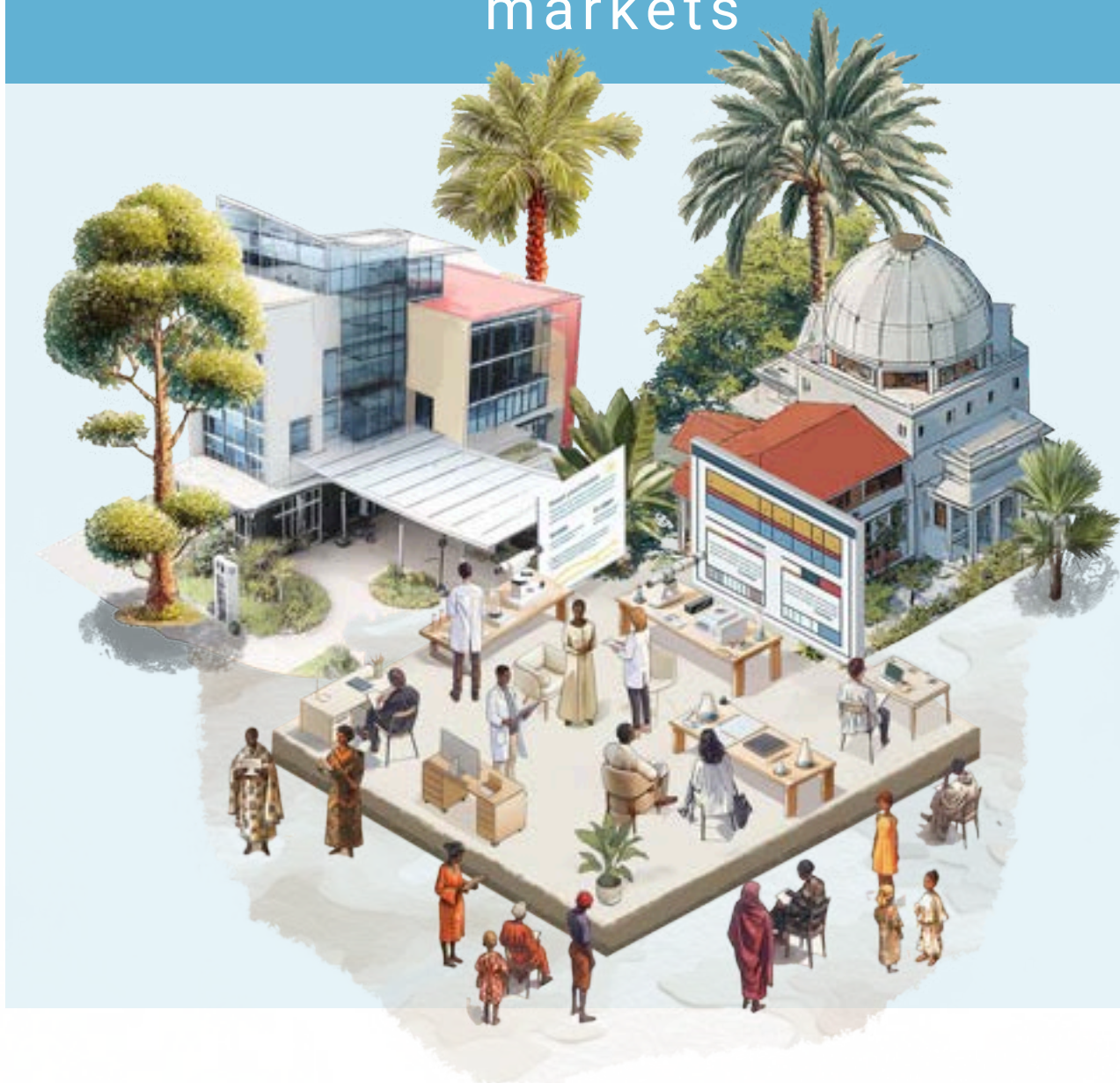
“Biodiversity is the baseline for everything on the planet, as in the end we are all interlinked. Biodiversity loss impacts food supplies and access to clean water, without it we have no future on our planet.”

UNEP, 2021

ROADMAPS

ROADMAP 1

Building a national system of innovation for climate technology markets



The right enabling environment (including standards, policies, frameworks, certification, national auditors, capacity building and incubators) supports the creation of a market for climate technologies.

Value of a national system of innovation:

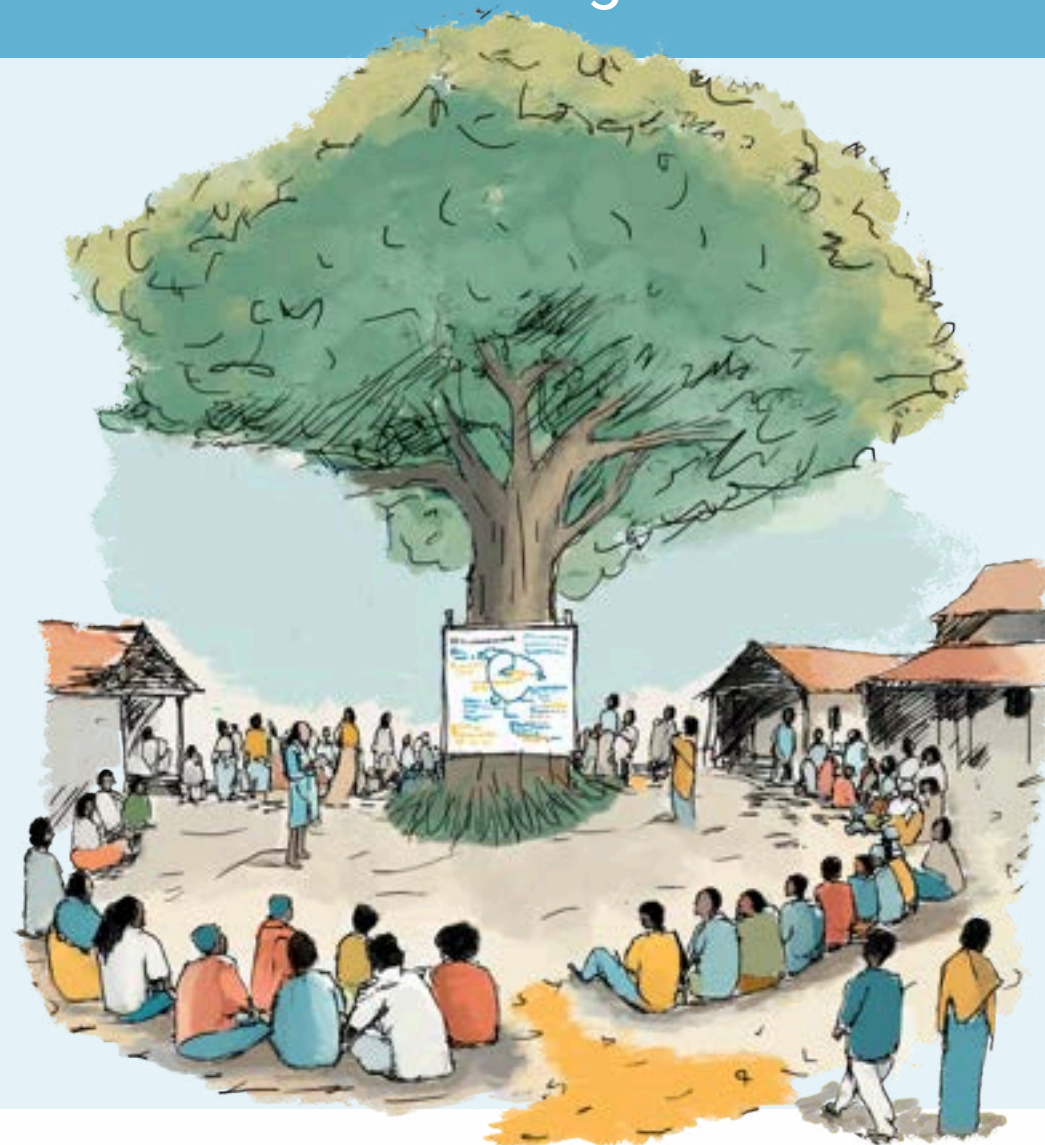
A national system of innovation develops a country's capacity to absorb, distribute, diffuse and deploy climate technologies. In a strong national system of innovation, all societal actors (governmental institutions, civil society, private sector, financial sector and academia) are involved in the process and benefit from the system.

6 steps to create a strong national system of innovation:

1. Problem articulation
2. Invention/Design
3. Prototyping
4. Monitoring, regulation and standards
5. Commercialization
6. Diffusion and scaling

ROADMAP 2

Supporting community-led climate innovation in fragile settings



Key steps and enabling factors at the community level support access to innovation and the scaling-up of conflict-sensitive, community-based climate technologies.

Value of community-led climate innovation:

Empowerment of frontline communities, entrepreneurs and local institutions allows them to co-create, adopt and sustain climate technology solutions that directly respond to context-specific vulnerabilities. Special attention must be given to participatory design, conflict-sensitive delivery, and implementation with fragility in consideration.

6 Steps to create community-led climate innovation:

1. Local problem framing
2. Community ideation and collaboration
3. Co-development and prototyping
4. Pilot testing and adaptation
5. Implementation and feedback
6. Institutional alignment and scaling



APPLYING THE ROADMAPS

The climate innovation process is dynamic, iterative and highly context-dependent. These roadmaps are not rigid templates but adaptable frameworks that guide countries, institutions, and communities through innovation phases based on their own capacities and goals.



Expect iteration, innovation is not linear

- Roadmap phases provide structure, but real-world innovation rarely follows a straight path. Teams may need to return to earlier phases, refine ideas based on feedback, or pivot entirely. Feedback loops, validation stages, and the flexibility to adjust direction are essential features of effective innovation journeys.



Learn from global experiences

- Other countries have tested and refined various technologies and innovation models. Users are encouraged to participate in masterclasses, peer-learning exchanges, and cross-regional dialogues to identify applicable insights, avoid known pitfalls and adopt good practices from comparable contexts.



Adapt to national and local contexts

- Innovation can mean different things to different countries; something tried and tested for one country could be innovative for another. Each country's political, regulatory and infrastructural landscape affects how innovation unfolds. Roadmap users should tailor strategies based on the needs and capacities of their NDE, institutions and communities.



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