

# **CORDIS Results Pack on Africa-EU collaboration**

## **Advancing the Africa-EU climate change and sustainable energy partnership**

A thematic collection of innovative EU-funded research results

May 2025



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## Editorial

As Europe's closest neighbour and strategic partner, Africa shares strong ties and mutual interests with the European Union. Their partnership is evolving into a forward-looking alliance addressing critical global challenges such as climate change and clean energy transition in support of resilience, energy access and inclusive green growth on both continents.

Africa is a continent on the rise. With over a billion people, the youngest population in the world (60 % of Africans are under the age of 25) and vast natural resources, it is brimming with potential. It also has a rapidly growing middle class, which means an increasing demand for resources, infrastructure and energy. By 2040, Africa will therefore need to double its energy supply. At the same time, 600 million people across the continent still do not have access to electricity.

The African continent is also highly vulnerable to the effects of climate change. Droughts, floods and shifting weather patterns are already threatening livelihoods, ecosystems, food security and public health. That is why building climate resilience, protecting natural resources and transitioning to a low-carbon economy are not only environmental imperatives, but also strategic objectives for regional stability and prosperity.

As Africa undergoes rapid transformation driven by economic, political, technological and demographic shifts, Europe has a unique opportunity to collaborate with its neighbour to co-create solutions to the challenges of the 21st century.

At the heart of the Climate Change and Sustainable Energy Partnership is a joint push to build reliable, sustainable and inclusive energy systems, which use clean and renewable sources such as solar power, geothermal, hydropower, bioenergy and wind. These efforts should improve energy efficiency and integrate power across regions for better energy security.

Just as crucial is the joint response to climate change. This includes advancing early warning systems, nature-based solutions, climate services, and risk-informed planning across key sectors such as water, agriculture, energy and health. By combining local knowledge with science-based tools, strengthening institutional capacity, supporting community-led action, and enhancing access to climate data, the Partnership aims to build systemic resilience.

In this way, a strong Europe-Africa partnership on climate change and sustainable energy can make a real difference, especially for rural communities, whether through new infrastructure, joint investments or knowledge-sharing.

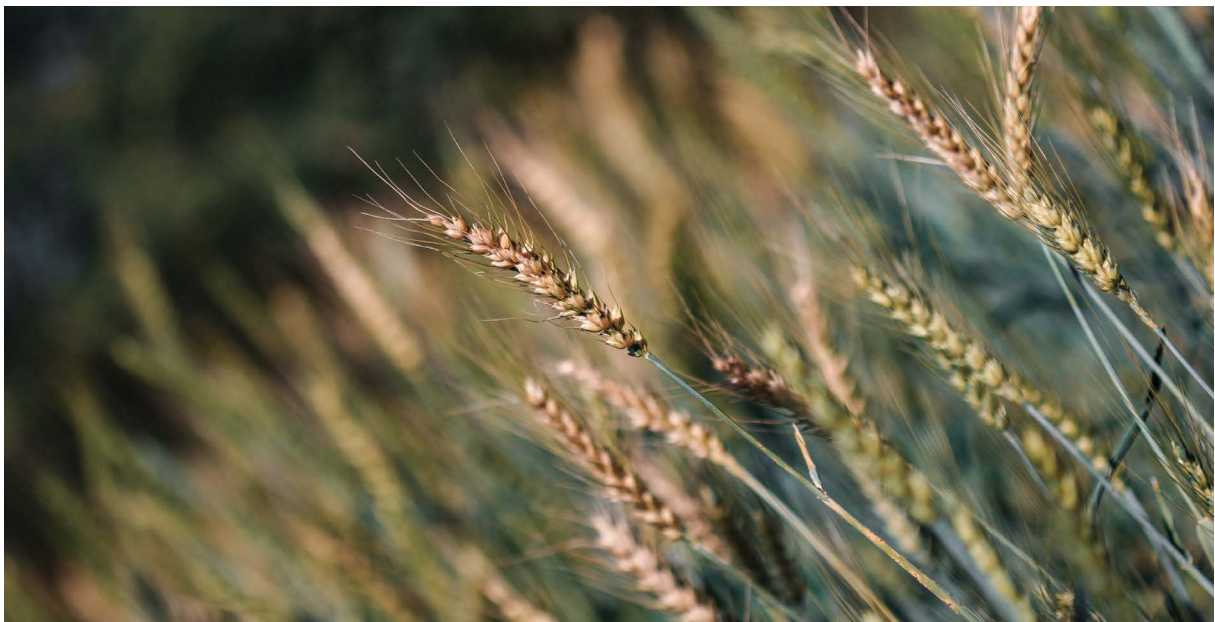
By working together, Europe and Africa can shape a greener, fairer and more resilient future for everyone. One of the most powerful tools at their disposal is joint research and innovation to foster climate intelligence, renewable energy and energy efficiency.

This new CORDIS Results Pack highlights 14 projects funded under the EU's Horizon 2020 and Horizon Europe research programmes - real-world examples of the Africa-EU partnership in action. They support the [African Union \(AU\)-EU Innovation Agenda](#) and the [Global approach to research and innovation](#). It highlights how joint R&I initiatives are supporting climate services, early warning systems, clean energy access, and adaptation planning, all while empowering local communities to become agents of change.

The Pack will enable policymakers, scientists and stakeholders to gain greater insight into the latest research and innovation, helping them to fine-tune their activities and test new tools and solutions developed via these projects.

# Empowering East African communities to adapt and thrive in changing climate patterns

East Africa's communities face risks from fluctuating weather patterns and extreme climate events. An EU-funded project addressed these challenges with new forecasting tools, targeted training and collaborations that strengthened local readiness and resilience.



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East Africa faces significant challenges from climate-related shocks as evidenced by prolonged droughts and severe flooding, which have left millions in need of assistance. The EU-funded ([CONFER](#)) project brought together a multinational team including African partners to strengthen the region's resilience to these climate impacts and reduce disaster risk.

CONFER sought to improve the development, communication and uptake of climate services, focusing on key sectors such as water, energy and food security. These areas are particularly vulnerable to climate variability, especially changes in rainfall patterns, which significantly affect livelihoods.

"The main goal was to co-produce actionable, tailored climate services in collaboration with users. By leveraging advanced modelling techniques, machine learning and participatory approaches, CONFER worked to provide tools and insights that empower communities to plan ahead and act proactively," says Erik Kolstad, project coordinator.

"As climate extremes such as droughts and flooding grow more frequent and severe, people in East Africa need solutions that allow them to act and plan better. That is where CONFER stepped in: addressing this need by combining science, collaboration and a strong commitment to meeting local needs," adds Kolstad.

## Advanced tools to boost climate resilience

CONFER united African and European partners to co-develop advanced climate services. Key activities included the creation of high-resolution forecasts for river streamflow and the timing of rainy season onset. It also introduced a machine learning model capable of predicting vegetation growth up to two months in advance.

Another key output was the creation of the SeaVal software package designed for evaluating forecasts. This tool is now publicly available and specifically adapted to meet the needs of East African weather services.

"CONFER does not stop at publishing scientific findings, we put a lot of emphasis on getting tools into use, supported by training and institutional buy-in," explains Kolstad.

## Building climate knowledge and local expertise

A major component of CONFER's efforts was capacity building. The project provided hands-on technical training across 10 countries, facilitated extended research visits to Europe and launched a highly successful massive open online course (MOOC) for journalists, which trained over 240 participants, many of them women.

CONFER also integrated its work into established frameworks like the [Greater Horn of Africa Climate Outlook Forum](#), ensuring that its tools and services reached national meteorological agencies and local decision-makers. These innovations are now being carried forward in a follow-up project – ACACIA.

"We did not just develop tools. As much as we could, we worked side by side with local experts and users to ensure these tools would be understood, used and sustained beyond the project lifespan," highlights Kolstad.

## Shaping a sustainable future with better preparedness and stronger alliances

CONFER created a lasting impact in the fight against climate challenges. It improved forecast usability, trained hundreds of practitioners and fostered a stronger science-policy interface. Project work enhanced early warning systems, particularly through integration with platforms like [ICPAC's East Africa Hazard Watch](#). By focusing on co-production and long-term partnerships, it laid the foundation for more equitable and effective climate services in the region.

Communication efforts also made a difference. The MOOC and media engagement initiatives significantly improved climate risk reporting by journalists.

"CONFER's legacy is not just about better forecasts. It is about smarter decisions, stronger preparedness and deeper partnerships for climate resilience in Africa. We hope it serves as a model for how science, policy and community engagement can come together to create sustainable and effective climate services," concludes Kolstad.



*CONFER's legacy is not just about better forecasts. It's about smarter decisions, stronger preparedness and deeper partnerships for climate resilience in Africa. We hope it serves as a model for how science, policy and community engagement can come together to create sustainable and effective climate services.*

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### PROJECT

**CONFER - Co-production of Climate Services for East Africa**

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### COORDINATED BY

NORCE NORWEGIAN RESEARCH CENTRE AS  
in Norway

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### FUNDED UNDER

Horizon 2020 - ENVIRONMENT

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### CORDIS FACTSHEET

[cordis.europa.eu/project/id/869730](https://cordis.europa.eu/project/id/869730)

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### PROJECT WEBSITE

[confer-h2020.eu/](https://confer-h2020.eu/)

# New climate tools to shape policies and secure the future of the Horn of Africa

Severe droughts are reshaping the lives of millions across the Horn of Africa, leaving communities vulnerable to water shortages and food crises, as well as floods. New climate services tools are offering hope and decision support for a more sustainable future in the region.



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The Horn of Africa drylands rely heavily on seasonal rainfall to support subsistence farming, primarily rainfed agriculture and pastoralism. This dependence makes the region highly vulnerable to climate hazards that manifest in water scarcity and food insecurity during droughts.

The EU-funded [DOWN2EARTH](#) project examined the connections between seasonal climate patterns, water scarcity and food insecurity, as well as their impacts, and provided actionable information for the rural communities in the region to protect their livelihoods and well-being.

“We promoted community-centred and institutional strategies for adapting to and building resilience against climate change impacts. By delivering tailored climate services, we concentrated on tackling water scarcity and its consequences at or near the Earth’s surface,” says Michael Singer, project coordinator.

With an interdisciplinary team of experts from 14 institutions from eight countries in Africa and Europe, DOWN2EARTH confronted the multi-faceted challenges of water scarcity and food insecurity in Ethiopia, Kenya and Somalia. This collaboration also allowed harvesting local traditional knowledge and combining it with the latest climate science to provide tailored support to the target communities.

## Innovative tools driving climate adaptation

DOWN2EARTH improved climate services and supported climate adaptation in the Horn of Africa drylands, including Ethiopia, Kenya and Somalia, through advanced decision-support tools,



capacity building, expanded data networks and policy enhancements.

A significant outcome was the creation of drylands-specific modelling system Climate into Useful Water And Land Information in Dryland [CUWALID](#) that predicts the impacts of upcoming rainy seasons over 2 million km<sup>2</sup> in the Horn of Africa drylands in a reliable way. Integrated with forecasts from IGAD Climate Prediction and Applications Center (ICPAC), the model and its impact-based forecasts are now a part of ICPAC's seasonal Greater Horn of Africa Outlook Forum (GHACOF), held three times a year.

"We created the world's first impact-based forecasting system that converts climate forecasts into actionable water and vegetation data tailored for drylands. Unlike existing global models, this system captures critical hydrological processes, including streamflow, soil moisture and groundwater dynamics," outlines Singer.

A social media chatbot [WujihaCast](#) delivers summarised data from the forecasting system in a user-friendly format, bridging the gap between science and action. "WujihaCast is an open-source Telegram chatbot that provides updates on climate impacts in various formats (maps, text, voice, images) and languages (Oromo, Swahili, English, Somali, Amharic). This tool serves local governments, non-governmental organisations, radio stations and other stakeholders," adds Singer.

Additional achievements include: expanding Somalia's weather station network, bridging critical data gaps caused by years of conflict; new regional-level policy frameworks leveraging agent-based modelling were developed; and multilingual media training courses to support journalists in climate reporting. The project also contributed substantially to BBC Media Action's [Living Climate Change](#) film series, offering worldwide a window into the struggles of rural communities facing the impacts of climate change.

*Throughout the project, we stayed closely connected with rural communities across Ethiopia, Kenya and Somalia. These relationships offered valuable insights into the challenges of climate change and adaptive capacities while fostering the uptake of our project outcomes.*

## Lasting tools for climate adaptation and action

"Throughout the project, we stayed closely connected with rural communities across Ethiopia, Kenya and Somalia. These relationships offered valuable insights into the challenges of climate change and adaptive capacities while fostering the uptake of our project outcomes," says Singer.

DOWN2EARTH's impact is expected to be strong and long-lasting, especially owing to the infrastructure embedded within institutions across the Horn of Africa drylands. ICPAC will continue using CUWALID and WujihaCast to deliver critical, easy-to-understand climate services that address the growing needs of the regions. Furthermore, the online training courses, climate change films and policy frameworks will remain valuable resources for diverse audiences.

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### PROJECT

**DOWN2EARTH - DOWN2EARTH: Translation of climate information into multilevel decision support for social adaptation, policy development, and resilience to water scarcity in the Horn of Africa Drylands**

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### COORDINATED BY

Cardiff University in the United Kingdom

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### FUNDED UNDER

Horizon 2020 - ENVIRONMENT

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### CORDIS FACTSHEET

[cordis.europa.eu/project/id/869550](https://cordis.europa.eu/project/id/869550)

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### PROJECT WEBSITE

[down2earthproject.org/](https://down2earthproject.org/)



# Bridging the gap between climate change and health

A Europe-Africa collaborative network is linking climate and health research to produce valuable knowledge outputs and to influence policy and practice in Europe, Africa, and beyond.

Climate change is widely acknowledged as one of the greatest threats to human health in the 21st century. Linking climate change and health research is crucial for the development of adaptation strategies to manage the health risks posed by a changing climate, including for building climate-resilient health systems.

The ENBEL initiative promoted interdisciplinary dialogue through conferences and workshops, focused interactions with decision-makers in Europe and Africa and strategically planned activities for raising awareness. Furthermore, central to ENBEL was the consolidation of findings from research studies to extract comprehensive insights relating to climate-health issues.

## Facilitating cross-disciplinary networking

The scope of the EU-funded [ENBEL](#) project was to bridge the gap between climate change and health research by coordinating projects and supporting adaptation and resilience.



*Our aim was to provide the necessary evidence on climate and health for EU policymakers by creating a space for interaction between climate scientists and health researchers.*

“Our aim was to provide the necessary evidence on climate and health for EU policymakers by creating a space for interaction between climate scientists and health researchers,” outlines project coordinator Kristin Aunan.

ENBEL established a collaborative platform that united climate scientists and health researchers from 12 [projects](#) funded by the [Belmont Forum](#) and the European Union. The Belmont Forum is a consortium of international research funding agencies which has initiated collaborative efforts to support transdisciplinary research in six continents at the nexus of climate, environment and health.

## Key findings and tools on climate change and health

While ENBEL did not conduct original research, it collected findings from ongoing and past projects to provide guidance. A key overarching result was the lack of formal evaluation of adaptation actions, particularly regarding the economic assessment of costs and benefits and evidence of effectiveness for vulnerable groups.

“Addressing these gaps is critical to delivering evidence-based guidance for adaptation policies and interventions,” emphasises Aunan.

Additionally, ENBEL highlighted the necessity for disease surveillance and health systems in Africa to incorporate environmental data, such as climate information, to understand health risks and develop effective early warning and adaptation strategies.

A significant achievement of ENBEL is the creation of the [ENBEL portal](#) an extensive library comprising over 250 training materials on climate and health. This portal also features research factsheets, videos, policy briefs, and tools aimed at supporting capacity building. Notably, 23 ENBEL knowledge products have been published in the European Climate and Health Observatory



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and other platforms, enhancing their accessibility and impact. One exemplary output is the policy brief on wildfires and health, which was referenced in the [European Environment Agency's 2024 report](#).

## Collaboration between Europe and Africa

Among ENBEL's most impactful and enduring outcomes is the establishment of the [Climate & Health Africa Network for Collaboration and Engagement](#) (CHANCE). This network brings together researchers, scientists, NGOs, and policymakers to exchange knowledge and develop new ideas.

By fostering collaboration, CHANCE strengthens research projects and reinforces the implementation of evidence-based actions to protect public health in Africa. Importantly it creates a platform for ongoing collaboration that strengthens research and policy implementation across continents.

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### PROJECT

**ENBEL - Enhancing Belmont Research Action to support EU policy making on climate change and health**

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### COORDINATED BY

CICERO Center for International Climate Research in Norway

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### FUNDED UNDER

Horizon 2020 - SOCIETAL CHALLENGES

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### CORDIS FACTSHEET

[cordis.europa.eu/project/id/101003966](https://cordis.europa.eu/project/id/101003966)

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### PROJECT WEBSITE

[enbel-project.eu/](https://enbel-project.eu/)



# Renewable energy technologies and integrated community energy systems in Africa

Co-creation of renewable energy technologies and strengthened local value chains are addressing pressing energy and climate challenges while supporting local communities.

Approximately half of Africa's population – about 600 million people – lack reliable access to electricity. At the same time, food and water security are threatened. While this poses a great challenge, addressing it offers tremendous opportunity for implementation of renewable energy technologies (RETs).

Sustainable uptake of RETs will require co-creation with stakeholders all along the value chain and easy replicability and scalability. The EU-funded [ENERGICA](#) project implemented collaborative methodologies to address local energy needs while considering resource availability. This is supporting positive technical, environmental, social and economic impacts and long-term sustainability.



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## Energy transition boards and integrated community energy systems

ENERGICA created energy transition boards comprising local stakeholders throughout the value chain to design and manage the RETs solutions. "The local energy transition boards were responsible for ensuring that the local technical, environmental, socio-economic and institutional conditions together with needs and capacities were considered when defining a technology's implementation," explains Boris Heinz of the [Technical University of Berlin](#), project coordinator.

The energy transition boards co-designed and managed the integrated community energy systems (ICESs). ICESs are innovative management and control systems designed to integrate distributed energy resources with the engagement of local communities.

## Tailored rural, peri-urban and urban demonstrators

Rural Madagascar has one of the lowest electrification rates in southern Africa. There, ENERGICA developed innovative DC nano-grids with tailored photovoltaic (PV) systems to support

the water-energy-food (WEF) nexus in off-grid communities. "In addition to supplying electricity to households for low-voltage consumer appliances, the PV-integrated nano-grids powered productive use systems for: water pumping, treatment and storage; rice husking; and food and water refrigeration," Heinz says.

While effective for household energy, demonstration showed that smaller-scale solutions are needed for productive use systems, such as a micro-local energy community for shared freezers rather than more expensive large-scale containerised solutions.



*The area's existing anaerobic digestion system now transforms organic waste into energy and fertiliser and is coupled to a water purification system.*

ENERGICA deployed low-tech, locally manufactured technologies for innovative integrated biogas digestion and water purification in peri-urban Sierra Leone. In a circular economy model considering local value chains, "the area's existing anaerobic digestion system now transforms organic waste into energy and fertiliser and is coupled to a water purification system," notes Heinz.

The project plans to support the hospital in Sierra Leone by valorising the biodigester's heat for hospital water heating and disinfection and is investigating the potential of hydrogen energy systems to produce medical-grade oxygen.

Finally, ENERGICA developed smart management systems for electric motorcycle fleets in on-grid areas in urban Nairobi. Nairobi gets about 85 % of its energy from RETs but has an outdated, inefficient transport system. The innovative software and solar-powered, grid-connected swapping stations increased decarbonisation while reducing power outages and electricity costs.

The demo's 10 [Roam Air](#) (electric motorcycle) hubs servicing 1 300 Roam Airs created 100 new jobs in the last year. Ongoing increasingly local production of Roam Air components is strengthening Kenya's manufacturing ecosystem and reducing reliance on imports.

## Business models and capacity building designed to increase local uptake

The demonstrators enable local entrepreneurs and workforce personnel to test RETs. Capacity building and training programmes including courses and materials will ensure workforce and community sustainability, job creation and RETs uptake. Taken together, ENERGICA's solutions support easy adoption, maintenance and local manufacturing as well as continued development, optimisation and tailoring.

ENERGICA has strengthened AU-European cooperation in energy and climate and shown that RETs co-tailored and implemented through efficient and sustainable community-based approaches can be effective in any societal context.

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### PROJECT

**ENERGICA - ENERGY access and green transition collaboratively demonstrated in urban and rural areas in Africa**

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### COORDINATED BY

Technical University of Berlin in Germany

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### FUNDED UNDER

Horizon 2020 - ENERGY

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### CORDIS FACTSHEET

[cordis.europa.eu/project/id/101037428](https://cordis.europa.eu/project/id/101037428)

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### PROJECT WEBSITE

[energica-h2020.eu/](https://energica-h2020.eu/)



# Habitable or not: migration decisions in the face of climate change

Environmental shocks make both socio-economic vulnerabilities and gender inequalities worse and thus drive migration decision making through socio-economic incentives.

Since 1990 when the International Panel on Climate Change [suggested](#) that “the gravest effects of climate change may be those on human migration”, scientists have rigorously studied this relationship. However, the multiple scales of migration and many interacting socio-economic and environmental factors make it challenging to quantify relationships to support policy making.

The EU-funded [HABITABLE](#) project brought together 22 partners from 18 countries to study migration and climate change at the level of ‘social-ecological systems’ – complex, adaptive and linked systems of humans and nature. HABITABLE focused on West Africa, East Africa, Southern Africa and South East Asia where migration rates are very high and social-ecological systems are highly vulnerable to climate change impacts. Methods including surveys, interviews and stakeholder dialogues enabled researchers to study households and their perceptions within the broader social-ecological system.

## Incentives for migration

HABITABLE found that the primary motivators of migration were economic: individuals and households often migrate in search of better employment opportunities and income sources to improve their lives. These economic drivers were followed by family considerations such as joining relatives or ensuring better care for family members, and educational aspirations – access to quality education was an important motivator. Environmental factors were rarely cited as the main driver for migration decisions.

François Gemenne of the [University of Liège](#), project coordinator, summarises: “Socio-economic factors dominate migration decision making; environmental shocks exacerbate existing socio-economic

vulnerabilities and drive migration decision making through socio-economic incentives.”

## Tipping points for climate-related migration

Statistical analyses of novel longitudinal data supported the presence of social tipping points at the household level for climate-related migration, influenced by intersecting social, economic and cultural factors. Poor, resource-dependent farming households reach their limits faster, leading to migration, while wealthier households can cope longer. People who see themselves as less wealthy are more likely to have no proactive coping strategies and report declining well-being due to environmental degradation.

“These findings highlight how migration decisions and ‘tipping points’ depend on local context and individual perceptions of changing risks. Worryingly, community-based coping mechanisms and social resilience overall are purportedly weakening, as climate impacts affect entire communities and make mutual support harder to sustain,” explains Gemenne. Community-level tipping points have not yet emerged but may as climate impacts worsen.



*These findings highlight how migration decisions and ‘tipping points’ depend on local context and individual perceptions of changing risks. Worryingly, community-based coping mechanisms and social resilience overall are purportedly weakening, as climate impacts affect entire communities and make mutual support harder to sustain.*



## Gendered and social equity dimensions of climate change and migration

Climate change worsens inequalities, which in turn shape migration responses; migration itself can either reduce or increase these inequalities. An empirical scoping review of 120 peer-reviewed articles and new qualitative insights showed that policies must consider gender and equity and be sensitive to migration's broader impacts to make migration an equaliser.

Adaptation is also gendered. For example, in East and West Africa, households where women participate in professional groups, like agricultural cooperatives, adopt more adaptation strategies than those led by men. However, women and youth often lack decision-making power over resources and migration. When working-aged men migrate, it can leave women without income, further decreasing habitability.

"As climate risks grow, migration tipping points are emerging at multiple levels of society. Ensuring liveable communities, sustainable livelihoods, and collective well-being requires

comprehensive and flexible policies together with multi-level governance that support communities to thrive while adapting to diverse migration patterns and vulnerabilities as conditions near or surpass social tipping points," summarises Gemenne.

For more insight, see HABITABLE's [reports and peer-reviewed articles](#) and its collection of [podcasts](#).

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### PROJECT

**HABITABLE - Linking Climate Change, Habitability and Social Tipping Points: Scenarios for Climate Migration**

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### COORDINATED BY

University of Liège in Belgium

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### FUNDED UNDER

Horizon 2020 - ENVIRONMENT

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### CORDIS FACTSHEET

[cordis.europa.eu/project/id/869395](https://cordis.europa.eu/project/id/869395)

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### PROJECT WEBSITE

[habitableproject.org/](https://habitableproject.org/)



# Tailored climate services to boost southern Africa's resilience

Southern Africa faces significant challenges from climate variability and extremes, disrupting vital sectors of the economy and wellbeing across the region.

An EU-funded project has developed tailored, sustainable climate services to strengthen resilience and drive informed decision-making in several regions.

The Southern African Development Community (SADC) region is highly susceptible to climate variability, change and extremes, such as floods, droughts and landslides, which affect critical sectors such as water resources, agriculture and infrastructure. Many countries in the region lack the necessary data, infrastructure, technical expertise and institutional capacity to deliver high-quality climate services.

Decision-making in climate adaptation often relies on outdated data and simplistic analyses, neglecting advancements in climate predictions. Furthermore, the effective application of

climate services in Africa continues to be a significant hurdle, as limited awareness and poor coordination among climate scientists and stakeholders hinder the effective use of climate services in some SADC countries.

The [FOCUS-Africa](#) project was established to create sustainable, customised climate services for the SADC region, demonstrating the entire value chain from development to application. This involved specific industries through practical case studies, improving climate prediction and projection science, and evaluating the social and economic benefits of these services.



## Transforming climate challenges into practical solutions

"We began by identifying the specific climate risks faced by different sectors and understanding the types of climate information users needed," says Roberta Boscolo, FOCUS-Africa project coordinator. "Efforts were then directed at generating practical data products based on a deep understanding of the regions' climate. New climate services and tools were developed and tested, tailored to the needs identified by users in the pilot studies."

Project members also assessed the socio-economic benefits of these services and planned strategies for their long-term sustainability. Building local expertise was a priority, with training and resources provided to strengthen regional climate service providers. Furthermore, strong engagement with stakeholders ensured that findings were widely shared and connections with users were strengthened.

"Our efforts resulted in several practical outcomes, including an online platform for accessing climate forecasts in Tanzania and Malawi and climate-resilient crop varieties for farmers in Mozambique", highlights Boscolo. Other achievements included a tool for determining optimal planting times in Mozambique, and a hydropower management tool for efficient energy generation in Tanzania.

Researchers also delivered five-year climate outlooks for Tanzania and Malawi, climate projections for South Africa to support agricultural adaptation and a flexible tool for processing seasonal climate forecasts for use in various regions.

## Driving climate resilience in southern Africa

FOCUS-Africa set out to create meaningful impacts by supporting specific climate adaptation policies in African countries thanks to co-designed, tailored and thoroughly evaluated climate services. The project boosted scientific capacity in

the region, contributing to global assessments, such as the Intergovernmental Panel on Climate Change, by developing innovative tools. "We strengthened adaptive capacity and resilience by encouraging the systematic use of advanced tools and verified climate services across key sectors," notes Boscolo. By prioritising user-driven development, FOCUS-Africa ensured that end-user communities were better informed and connected, following the principles of the user interface platform of the Global Framework for Climate Services.

Special attention was devoted to improving women's access to climate services, addressing gender-specific needs in their design and dissemination.

FOCUS-Africa has played a pivotal role in empowering southern Africa to tackle the pressing challenges of climate change. "By prioritising collaboration, user-focused design and practical solutions, FOCUS-Africa has strengthened the region's ability to adapt and build greater climate resilience. The tools, knowledge and partnerships it has developed will continue to support climate resilience and action in the region for years to come," concludes Boscolo.



*By prioritising collaboration, user-focused design and practical solutions, FOCUS-Africa has strengthened the region's ability to adapt and build greater climate resilience. The tools, knowledge and partnerships it has developed will continue to support climate resilience and action in the region for years to come.*

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### PROJECT

**FOCUS-Africa - Full-value chain Optimised Climate User-centric Services for Southern Africa: FOCUS-Africa**

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### COORDINATED BY

World Meteorological Organization in Switzerland

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### FUNDED UNDER

Horizon 2020 - ENVIRONMENT

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### CORDIS FACTSHEET

[cordis.europa.eu/project/id/869575](https://cordis.europa.eu/project/id/869575)

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### PROJECT WEBSITE

[focus-africaproject.eu/](https://focus-africaproject.eu/)

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# Collaborative modelling for new climate commitments

Global research centres, including universities in Kenya and Ethiopia, collaborate with stakeholders in four partner countries to co-create integrated assessment models that address relevant climate and sustainability concerns.



At the heart of the Paris Agreement, the flagship of global efforts to combat climate change, is each country's [nationally determined contributions](#) (NDCs). Contrary to expectations, current climate policies and the NDCs that support them are not on track to meet objectives. Countries around the world must reevaluate their commitment to fighting global warming and produce more ambitious NDCs for 2030 and beyond.

"NDCs must be realistic and ambitious, while also meeting the needs of both sustainable development and climate mitigation," notes the KTH team, led by Francesco Gardumi. Diverse tools and input from a wide range of constituencies are required. The EU-funded [IAM COMPACT](#) project co-created a research process involving scientists and other stakeholders to leverage [integrated assessment models](#) (IAMs) and produce new climate policies.

## Infrastructure for holistic IAMs

IAMs incorporate features of society such as economics and development to inform policy decisions related to climate change. To facilitate the inclusion of more non-scientists in the next phase of NDC development, the project created a communication scaffold.

Elements of the communication infrastructure created by researchers and other stakeholders include listening, exchanging, modelling, expanding and explaining. This fruitful structure has led to over 50 papers in top tier journals, 22 model documentation videos, reports on global and regional long-term mitigation targets and numerous conferences, policy events and briefs.

## The Policy Response Mechanism

These successful outcomes were built on a strong foundation of listening. According to project manager Natasha Frilingou, at the heart of the listening component is the [Policy Response Mechanism](#). Frilingou states: "This Mechanism constitutes a valuable tool at the science-policy interface, a co-creation process that has facilitated not only our internal exchanges, but also our collaboration with external stakeholders."

This constitutes a cyclic process involving clearly identified roles: modellers, policy steering groups and core working groups composed of technical policy, industry and civil society stakeholders. The process ensures policy relevance, exchange of knowledge and trust between involved parties. As Conall Heussaff from Bruegel, in charge of stakeholder engagement, emphasises: "The research process in IAM COMPACT has been entirely driven by, and co-created with, non-scientists via the Policy Response Mechanism in a series of exchanges with different groups of external actors."



*The ensemble of new, fully open-source and freely available models developed by the project includes two nexus and spatial electrification modelling tools for Ethiopia, one climate-land-energy-water system model for Sri Lanka and one for Kenya, and an energy-system model for Ukraine.*

## International capacity development

"Some countries face challenges in carrying out technical assessments that ensure full ownership of their NDCs," notes Solomon Tesfamariam of Addis Ababa University. Project partners worked with Ethiopia, Kenya, Sri Lanka and Ukraine to co-create science-based climate policies relevant to these countries. "The ensemble of new, fully open-source and freely available models developed by the project includes two nexus and spatial electrification modelling tools for Ethiopia, one climate-land-energy-water system model for Sri Lanka and one for Kenya, and an energy-system model for Ukraine," project coordinator Alexandros Nikas adds.

Exchange of knowledge also involved training new experts. IAM COMPACT emphasised teaching younger minds in the four target countries. Ioannis Tsipouridis, of the Technical University of Mombasa, adds: "A six-month course on nexus modelling was offered at three Kenyan universities, and a capacity development session at the [Joint Global Summer School](#) at ICTP in August 2024 was well attended."

The project is ongoing, but already its holistic, co-creative approach has many positive results. All countries must step up in the fight against climate change, and IAM COMPACT's approach offers a way forward.

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### PROJECT

**IAM COMPACT - Expanding Integrated Assessment Modelling: Comprehensive and Comprehensible Science for Sustainable, Co-Created Climate Action**

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### COORDINATED BY

National Technical University of Athens (NTUA)  
in Greece

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### FUNDED UNDER

Horizon Europe - Climate, Energy and Mobility

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### CORDIS FACTSHEET

[cordis.europa.eu/project/id/101056306](https://cordis.europa.eu/project/id/101056306)

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### PROJECT WEBSITE

[iam-compact.eu/](https://iam-compact.eu/)



# Improved data collection and new services for atmospheric and climate science in Africa

An EU-Africa collaboration has strengthened Africa's ability to monitor, predict and respond to the effects of rapidly increasing atmospheric greenhouse gases on Earth systems, coastal oceans and cities.



© KADI Dar Es Salaam Pilot

Despite its low contribution to global greenhouse gas (GHG) emissions, Africa is disproportionately affected by climate change and climate adaptation costs. While disparate climate data resources exist in Africa, the continent needs a comprehensive climate observation system with improved data quality and accessibility to underpin the development of the climate services required to mitigate and adapt to climate change.

A previous EU-African Union project, [SEACRIFOG](#) focused on mapping existing observations and infrastructures across Africa that were relevant to the development of climate services. The EU-funded [KADI project](#) has built on this in a co-creation paradigm with local stakeholders.

According to project coordinator Werner L. Kutsch of [ICOS ERIC](#), “KADI strengthened pan-African data and observation research infrastructures (RIs) for atmospheric and climate services and has delivered the training required to ensure the sustainable, long-term RI development.”



*KADI strengthened pan-African data and observation research infrastructures (RIs) for atmospheric and climate services and has delivered the training required to ensure the sustainable, long-term RI development.*

## Earth systems and coastal oceans

The Earth system modelling pilot increased the spatial resolution of land-surface attributes of the first African Earth system model. In addition, “new data regarding vegetation types, fire-vegetation interactions and access to soil moisture were used in the analysis of dryland ecosystems (savanna and grassland),” notes Kutsch.

Comparison of model predictions to observations allowed the team to identify potential model biases across the larger

region. Improved models will allow scientists to better evaluate and predict interannual variations in land-atmosphere carbon flux and to better understand the underlying drivers.

“The coastal biogeochemistry pilot aimed to quantify key elements of the coastal carbon cycle and their role in regulating global climate,” Kutsch explains. KADI highlighted the need to increase observation resources and knowledge sharing for large-scale predictive models, including with low-cost sensors and mentoring programmes.

## Climate drivers and urban resilience

KADI also conducted urban climate service pilots in Dar es Salaam, Nairobi and Abidjan. “The urban pilots used low-cost digital sensors and citizen science methods to develop climate services supporting prediction and adaptation to heat stress, flash floods and air pollution,” says Kutsch.

For example, in Nairobi, where about half of the 5 million residents live in settlements covering 1 % of the city’s land, improved climate forecasting will increase inhabitants’ resilience to extreme heat and flash floods. In Abidjan, the lack of a real-time air quality measurement network and forecasting system posed challenges to monitoring the already high and growing levels of particulate matter, largely due to fossil fuel combustion and burning of waste associated with a rapidly increasing population. The pilot developed and tested a service producing real-time air quality indicator maps, enabling identification of causes and management of the effects of air pollution.

In Dar Es Salaam, participatory mapping and community engagement, data collection, particularly in vulnerable areas of the city where rapid urban growth has heightened climate risks, helps integrate geospatial and Earth Observation data to enhance climate risk assessments and decision-making.

## Training and ‘stakeholder champions’

‘Stakeholder champions’ were identified and prepared to advocate for the needs of their countries, institutions and networks. Together with KADI researchers, these stakeholder champions will be part of a community of practice that remains after the project ends.

KADI has also mapped national capabilities and equipment availability and created long-term training programmes for in-depth skill development that will support national and international endeavours and dialogues. For example, practical hands-on training on coastal GHG measurements upskilled participants from 13 African countries to provide data to the ‘Surface Ocean CO<sub>2</sub> Reference Observing Network’ [SOCONET](#). “The work of KADI was highlighted at the opening of the International Conference on Southern Hemisphere Meteorology and Oceanography (ICSHMO),” notes Kutsch.

KADI has improved the accuracy and accessibility of climate information across Africa. This will help African scientists and policymakers improve climate adaptation, mitigation and resilience in sub-Saharan Africa while supporting them in negotiations with other regions in the framework of the Paris Agreement.

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### PROJECT

**KADI - Knowledge and climate services from an African observation and Data research Infrastructure**

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### COORDINATED BY

Integrated Carbon Observation System European Research Infrastructure Consortium (ICOS ERIC) in Finland

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### FUNDED UNDER

Horizon Europe - Research infrastructures

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### CORDIS FACTSHEET

[cordis.europa.eu/project/id/101058525](https://cordis.europa.eu/project/id/101058525)

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### PROJECT WEBSITE

[kadi-project.eu/](https://kadi-project.eu/)

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# Expanding and strengthening renewable energy initiatives in Africa

A collaborative Africa-Europe funding mechanism fostered co-creation, shared goals and mutual benefits in projects, local pilots and capacity building, supporting long-term sustainable energy goals.

Within the framework of the joint Africa-EU strategy, the African Union (AU)-EU high level policy dialogue (HLPD) on science, technology and innovation establishes long-term priorities for research and innovation policy. Climate change and energy sustainability are key focus areas.

Among HLPD initiatives is the jointly funded AU-EU research and innovation (R&I) partnership on climate change and sustainable energy. Its flagship [LEAP-RE](#) project on energy is promoting a cooperative ecosystem through joint funding calls, institutional twinning, peer-to-peer exchange, capacity-building activities, stakeholder forums and an online knowledge-sharing [platform](#). In addition, science diplomacy links LEAP-RE to [Mission 300](#), which aims to provide electricity to 300 million Africans by 2030.

## Augmenting impact within prioritised themes

"LEAP-RE has established a bi-continental co-funding mechanism through which African and European funding organisations set joint priorities and fund R&I projects that focus on achieving goals of mutual benefit," explains Léonard Lévêque of [LGI Sustainable Innovation](#) in France, LEAP-RE project coordinator. This initiative aims to reduce fragmentation by bringing together diverse stakeholders, including researchers, academic institutions, funding agencies and investors, policymakers, the private sector and local communities.

The project covers seven priority themes. These comprise assessment of renewable energy sources (RES) and integration of RES in sustainable energy scenarios along with end-of-life and second-life management and environmental impact of RES system components. Smart stand-alone systems and smart grid systems for off-grid application are also included. In addition, processes and appliances for productive uses (agriculture, mobility and industry) as well as innovative solutions for priority domestic uses (clean cooking and cold chain) are funding themes. Finally, the production and utilisation of green hydrogen was added in 2025.



© LEAP-RE Project

## Projects and pilots in a participatory approach

Within the project duration, [31 projects](#) have been funded. An additional call was launched in 2025, and another is planned for 2026. “These projects represent early-stage technological innovations and pre-commercial solutions with strong potential for scaling up and market deployment,” notes Lévêque.



*Through a participatory and inclusive approach, funded projects also conduct renewable energy solution pilots with local communities to address their needs and priorities, aiming to foster socio-economic development and improve their quality of life.*

For example, the SolCharge project is developing a modular, mobile solar charging solution for off-grid communities. Adaptable for stationary, mobile and electric vehicle applications, it supports clean mobility and reduces fossil fuel dependence.

“Through a participatory and inclusive approach, funded projects also conduct renewable energy solution pilots with local communities to address their needs and priorities, aiming to foster socio-economic development and improve their quality of life,” adds Tinyiko Ntshongwana of the [Department of Science, Technology and Innovation](#) of the Republic of South Africa. The Geothermal Village project, for example, is introducing stand-alone geothermal energy systems to off-grid communities in East Africa, leveraging the region’s untapped geothermal resources.

## Teamwork and training ensure engagement and sustainability

LEAP-RE facilitates technology transfer and knowledge sharing through institutional twinning, scientific outreach, peer-to-peer exchanges and clustering. Lévêque notes: “The project also focuses on local capacity building, ensuring that trained youth and community members can maintain and expand the systems, promoting long-term energy independence and economic growth.” LEAP-RE RESchools provide technical training and capacity building for researchers and students, and institutional twinning strengthens long-term partnerships between African and European institutions.

In line with the European Commission’s [Global Gateway](#) principle of equal partnerships, LEAP-RE prioritises collaboration, mutualisation, joint decision-making, and shared strategic and financial commitments between African and European partners. This teamwork is bearing fruit, bringing the best of European and African innovation together to address climate change and sustainable energy for the long term in Africa.

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### PROJECT

**LEAP-RE - Long-Term Joint EU-AU Research and Innovation Partnership on Renewable Energy**

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### COORDINATED BY

LGI Sustainable Innovation in France

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### FUNDED UNDER

Horizon 2020 - ENERGY

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### CORDIS FACTSHEET

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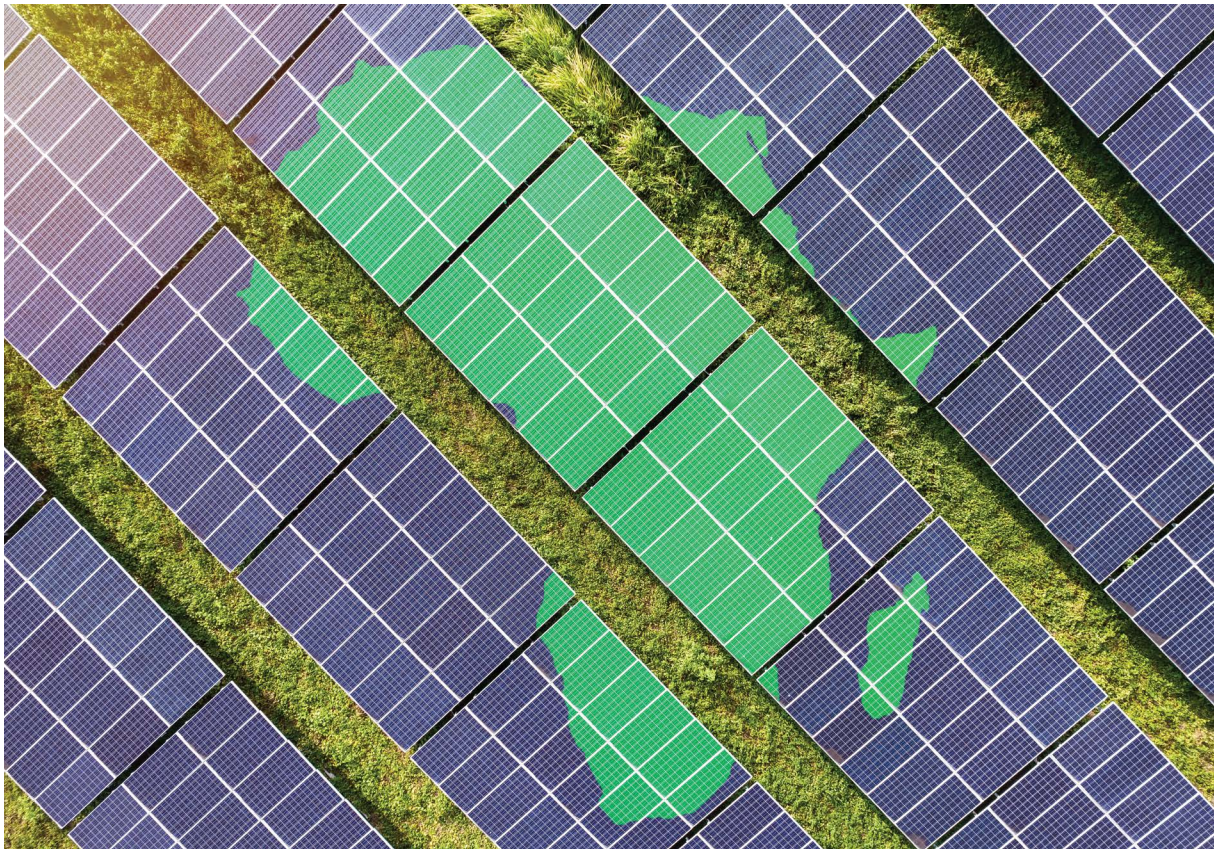
### PROJECT WEBSITE

[leap-re.eu/](https://leap-re.eu/)



# Multi-sector models for Africa's green future

With a focus on water, energy and food, tailor-made models for a clean energy transition in Africa address socio-economic and technical needs.



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With more than 18 % of the world's population, Africa is one of the fastest growing and most populous regions of the world, expected to make up 25 % of the global population by 2050. There is huge potential for renewable energy sources on the continent, and many African leaders have shown interest in the development of clean energy infrastructure, in accordance with the [Africa Agenda 2063](#).

But before great changes can be made, a deeper understanding of the intersectoral impacts of a green energy transformation

must be gained. Using [WEF Nexus](#) resources, the ONEPlanET project developed models centred on the connection between water, energy and food.

Water, energy and food resources are interdependent. Agriculture is the biggest water user in sub-Saharan Africa, and 13% of energy goes to food production on the continent. Still, 282 million people were undernourished in 2022, and increase of more than 20 % since the COVID 19 pandemic.

## A holistic approach to change



*ONEPlanET aims at empowering African policy makers, research and academia, investors and citizens with the necessary tools and know-how to increase clean energy generation and sustainable use of resources while reducing inequalities and cultural/socio-economic gaps.*

Many challenges confront African communities, including energy poverty, water scarcity, food insecurity and environmental degradation. The ONEPlanET team chose to use WEF Nexus as a basis for modelling the interconnection between water, energy and food with the goal of addressing the needs of multiple constituencies.

This holistic approach considers the many impacts of energy infrastructure development. According to project coordinator Serena Scotton: "ONEPlanET aims at empowering African policy makers, research and academia, investors and citizens with the necessary tools and know-how to increase clean energy generation and sustainable use of resources while reducing inequalities and cultural/socio-economic gaps."

## WEF Nexus

WEF Nexus, an independent platform under the Nexus Regional Dialogues framework, is an excellent resource for the aims of ONEPlanET. The platform promotes an integrated approach to the use of natural resources that ensures equitable access for all.

"We believe that the interconnection between water, energy and food on the African continent is deeply important and has a solid connection to some of the main obstacles the population is facing", Scotton shares, underscoring the relevance of WEF Nexus for addressing Africa's clean energy transition. The WEF concept informed the development of three tailor-made models in the Songwe (Malawi and Tanzania), Inkomati-Usuthu (South Africa) and Niger (Nigeria) river basins.

## ONEplanET outcomes

Communication, co-creation and networking are key to the project's holistic approach. ONEPlanET has participated in 14 dissemination events, including workshops hosted in each of the demonstration locations and in Nairobi. The project has also published three policy briefs and a list of key actionable elements to guide policy makers.

Scotton notes: "We have already launched the [knowledge hub](#) platform, hosting the WEF Nexus database, tools and several training videos publicly available for all the stakeholders presenting a set of capacity-building materials and knowledge exchange activities." With this inclusive approach, ONEPlanET is investing in the potential of Africa to realise economic growth and societal progress through the intersection of sustainable water, energy and food development.

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### PROJECT

**ONEPlanET - OpeN source nExus modelling tools for Planning sustainable Energy Transition in Africa**

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### COORDINATED BY

RINA consulting s.p.a. in Italy

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### FUNDED UNDER

Horizon 2020 - Climate, Energy and Mobility

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### CORDIS FACTSHEET

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### PROJECT WEBSITE

[oneplanetproject.eu/](https://oneplanetproject.eu/)



# Increasing energy access and empowering communities in Africa

A pioneering EU-Africa collaboration has delivered practical energy access solutions and nurtured their adoption by widespread replication and an innovative incubator programme.



Many renewable energy solutions exist to increase energy access and support a clean energy transition, but deployment and sustainability may not be feasible without consideration of local contexts. The EU-funded [SESA](#) project is fostering collaborative innovation by connecting African and European partners, local communities and entrepreneurs to co-develop and test practical renewable energy solutions.

Tailoring solutions to local needs while raising awareness and building skills, SESA is not only increasing energy access but also generating local opportunities for economic development and social cohesion in Africa.

Co-creation roadmap:  
innovation, business  
models, replicability  
and scale-up

SESA first identified innovations with strong potential for widespread adoption and tested them in living labs (pilots) in diverse socio-economic settings in Ghana, Kenya, Malawi, Morocco and South Africa. To further foster growth and adoption, a start-up incubator programme and seed funding supported 20 SMEs to implement SESA technologies and business models.

The incubator programme provided tailored growth support, capacity building and mentoring to strengthen financial

*Eight sustainable business models were developed, implemented and then replicated across the project countries. This ensured that the renewable energy technologies and business models were fine-tuned for maximum impact when scaled to Tanzania, Namibia, Rwanda and Nigeria.*

sustainability. According to project coordinator Magdalena Sikorowska of [ICLEI European Secretariat](#): “Eight sustainable business models were developed, implemented and then replicated across the project countries. This ensured that the renewable energy technologies and business models were fine-tuned for maximum impact when scaled to Tanzania, Namibia, Rwanda and Nigeria.”

Scalability was further supported by standardised implementation plans and customised policy roadmaps addressing country-specific financial, legal, regulatory and social challenges.

Innovation drives  
economic, social and  
environmental impact

E-bike rentals, a pay-per-use solar photovoltaic (PV) cold storage room, pay-as-you-go e-scooters, direct-sale of cookstoves, lease-to-own solar irrigation, and pay-as-you-go and subscription models for mini-grids and/or solar generators were the eight business models selected. “SESA’s co-created solutions have been implemented across nine African countries: Ghana, Kenya, Malawi, Morocco, Namibia, Nigeria, Rwanda, South Africa and Tanzania,” notes Sikorowska.

Among the many exciting outcomes, solar PV micro-grids in Ghana have electrified 54 homes, the country has begun a solar battery recycling initiative, and some Ghanaian schools have adopted biofuel cookstoves. In Malawi, 13 solar irrigation

systems were sold to small-holder farmers and 18 bio-cookers using biomass briquettes produced via a local supply chain have been deployed. The more than 3 000 improved biofuel cookstoves sold in Rwanda and relying on agro-waste pellets have reduced CO<sub>2</sub> emissions by more than 48 000 tonnes. Finally, the 40 e-scooters deployed in Morocco are decarbonising urban transport.

## Lessons learned and the way forward

The project revealed essential elements for successful adoption of innovative renewable energy technologies in Africa. “We found that community engagement in co-designing solutions is critical,” says Sikorowska.

Co-creation ensured technologies were aligned with community needs and affordability. Economic barriers were reduced with flexible payment models and local supply chains, the latter of which also increased autonomy. Furthermore, integrating circular economy approaches addressed ecological risks while creating jobs and reducing waste. Finally, awareness campaigns and training deepened climate and environmental understanding, fostering adoption.

SESA has created a variety of resources to support deployment of its renewable energy solutions. Its open access [toolbox](#), including its catalogue of sustainable energy solutions, and its [e-learning platform](#) will help diverse stakeholders explore, design, manage and implement cleaner, more efficient energy solutions. SESA also created policy roadmaps and briefs based on a barrier analysis leveraging nine case studies. These can serve as starting points for policy discussion and development.

SESA's technologies and business models have increased sustainable energy access in Africa, empowering communities and driving economic and social progress. Their replicability along with resources to support deployment and sustainability ensure long-term impact.



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### PROJECT

**SESA - Smart Energy Solutions for Africa**

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### COORDINATED BY

ICLEI European Secretariat in Germany

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### FUNDED UNDER

Horizon 2020 - ENERGY

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### PROJECT WEBSITE

[sesa-euafrica.eu/](https://sesa-euafrica.eu/)



# Renewable energy solution for better healthcare in Africa

Access to healthcare in rural Africa remains a pressing challenge. Harnessing the abundant solar potential to build innovative renewable energy solutions has the potential to transform healthcare.

Around a quarter of healthcare facilities across sub-Saharan Africa operate without electricity and only 28 % report reliable power. This reality directly impacts the quality of care in over 120 000 public health facilities, including approximately 22 000 hospitals and 98 000 health posts. Without reliable energy and clean water, basic medical services and quality of care from vaccine storage, surgical sterilisation and sanitation remain compromised.

## Tailored solar energy for remote hospitals

The EU-funded [SophiA](#) project set out to change this reality by delivering clean energy, refrigeration and water solutions tailored specifically for remote African healthcare settings in Burkina Faso, Cameroon, Malawi, and Uganda. The consortium has developed modular systems powered entirely by solar energy. Each system delivers refrigeration, water purification, and steam generation using a mix of photovoltaics and solar thermal technology.

The SophiA system offers stable temperatures essential for preserving blood plasma, vaccines, and other temperature-sensitive supplies. Complementing this is a water purification module that provides safe, pathogen-free drinking water, as well as deionised and hot water for medical use. To ensure reliable operation and energy efficiency even when sunlight is intermittent, the team has developed a low-temperature thermal storage system based on ice and an innovative high-temperature energy storage unit.

Moreover, the project has introduced the PVmedPort, a stand-alone solar-powered unit designed for mobile outreach vaccination and education campaigns beyond hospital walls. It includes shaded benches, solar-powered refrigeration, and can function as a fully autonomous care station.

“Crucially, the SophiA-generated systems have been designed to integrate seamlessly with existing infrastructure, eliminating the need for major structural changes to hospital buildings,” outlines project coordinator Michael Kauffeld.

## Cross-continent collaboration

SophiA brought together engineers, scientists, social researchers, and public health officials from both Europe and Africa. African partners, including [Everflo](#) in South Africa and academic institutions [ZiE](#) in Burkina Faso and [Makerere University](#) in Uganda, played leading roles in manufacturing, local training, and social acceptance. European partners provided complementary technical expertise, project coordination, and capacity building. The resulting partnership has proven to be mutually enriching and highly effective in translating innovation into impact.



*The SophiA-generated systems have been designed to integrate seamlessly with existing infrastructure, eliminating the need for major structural changes to hospital buildings.*

Among the project's biggest challenges were logistical hurdles such as navigating complex customs regulations in the four African countries and dealing with global supply chain disruptions due to geopolitical tensions. Nonetheless, the team overcame these obstacles with determination.

As Kauffeld reflects: "It wasn't rocket science to build the systems but making it all happen across four African countries was an incredible journey. The real reward comes from the impact of the work; staff and patients enjoying the safe operation of rural clinics."

## Lasting impact and future prospects

As the project enters its final phase, installations in Malawi and Uganda are being completed and data collection continues. Looking ahead, the consortium is working to secure funding or establish a SophiA Foundation to expand installations across the continent.

Ultimately, the project offers a compelling model of how clean energy can be harnessed to strengthen healthcare infrastructure, improve lives, and contribute to global development goals.

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### PROJECT

**SophiA - SUSTAINABLE OFF-GRID SOLUTIONS  
FOR PHARMACIES AND HOSPITALS IN AFRICA**

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### COORDINATED BY

Karlsruhe University of Applied Sciences in Germany

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### FUNDED UNDER

Horizon 2020 - SOCIETAL CHALLENGES

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[cordis.europa.eu/project/id/101036836](https://cordis.europa.eu/project/id/101036836)

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### PROJECT WEBSITE

[sophia4africa.eu/](https://sophia4africa.eu/)

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# Turning encroaching bush into long lasting fuel in southern Africa

Invasive overgrowth in southern Africa is being transformed from a problem into a source of clean energy for households and industry.

Over 120 million hectares across southern Africa, 45 million in Namibia alone, have been degraded by bush encroachment and invasive alien species. This woody overgrowth suppresses herbaceous plants and ecological diversity, and depletes groundwater reserves, impacting on wildlife and livestock.

“Southern Africa also has high levels of rural poverty, especially amongst women and youths, with unemployment over 50 %,” notes [SteamBioAfrica](#) project coordinator Heike Knicker from the [Spanish National Research Council](#) (CSIC) in Spain. “This poverty is reflected in the region suffering from the highest income inequality in the world.”

Another key challenge is the fact that the region’s energy supply is dominated by coal. “South Africa alone annually extracts and burns over 200 million tonnes/year,” say Knicker. “Off-grid communities burn firewood or charcoal over open fires to meet their cooking and heating demand, with associated health impacts predominantly affecting women and children.”

## Turning bush into a solid biofuel

The ambitious EU-funded SteamBioAfrica project set out to address these multiple challenges. The key aim was to demonstrate that an innovative process called [superheated steam torrefaction](#) could be used to transform bush plants into a solid biofuel with coal-like properties.



*We wanted to show that the bush could be used as fuel, without the need for capital investment or loss of efficiency. This would be a cleaner burning alternative to firewood or charcoal.*

“We wanted to show that the bush could be used as fuel, without the need for capital investment or loss of efficiency,” adds Knicker. “This would be a cleaner burning alternative to firewood or charcoal.”

To achieve this, the project team built and deployed a small industrial-scale demonstration unit in rural Namibia near Otjiwarongo, an area blighted by bush encroachment. Operating at 250 kg/hour, it successfully processed over 200 tonnes of bush.

To ensure holistic benefits, numerous [studies](#) were carried out. These covered issues ranging from life cycle studies and value chain development through to soil science, gender and harvesting.

## Large-scale replication across southern Africa

The output from the plant was validated by industry and households, with promising results. A number of industrial stakeholders have expressed an interest in taking the technology forward towards eventual commercialisation.

“The goal now is to achieve cost parity with coal,” remarks project innovation manager Huw Parry. “This would enable the large-scale replication of this technology across southern Africa.” This would help to sustainably reduce bush encroachment, achieve land restoration and boost rural job creation.



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“Just one industrial unit operating at 5 tonnes an hour would directly result in the sustainable recovery of over 4 000 hectares a year,” notes Parry. “While the focus of this work has been concentrated on southern Africa, this does not exclude the application of this technology to address wider global challenges caused by encroachment and invasive species.”

## Plant upgrade for economic performance and efficiency

To achieve cost parity with coal, the demonstration unit will need to be further upgraded, to improve its economic performance. A fully costed upgrade plan has been prepared, with identified measures, primarily in energy efficiency and automation.

“To implement these measures, additional funding is currently being sought,” says Parry. “Once the plant upgrades have been implemented and validated, commercial investment will be readily achievable in upscaled replication.”

A local cement works is provisionally prepared to host the first commercial-scale industrial deployment, which would be owned and operated by SteamBioAfrica project partners. This will take place once the upgrades to the existing plant have been fully validated.

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### PROJECT

**SteamBioAfrica - Innovative Large-Scale Production of Affordable Clean Burning Solid Biofuel and Water in Southern Africa: transforming bush encroachment from a problem into a secure and sustainable energy source**

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### COORDINATED BY

Agencia Estatal Consejo Superior de Investigaciones Científicas in Spain

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### FUNDED UNDER

Horizon 2020 - SOCIETAL CHALLENGES

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### CORDIS FACTSHEET

[cordis.europa.eu/project/id/101036401](https://cordis.europa.eu/project/id/101036401)

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### PROJECT WEBSITE

[steambioafrica.com/](https://steambioafrica.com/)



# Low-cost solutions improve water management in Africa

A financially sustainable approach to hydrological measurements uses simple, innovative tools to provide reliable data for water management services.



© Anna Gralka

Africa is home to over 1 billion people, and it has one of the fastest growing populations in the world. To better manage its resources, Africa needs economically sustainable solutions for water monitoring. The EU-funded [TEMBO Africa](#) project aims to reduce the cost of measuring hydrological variables for three water-related services by more than 90 %.

## Water-focused services

For the African market in Ghana, Kenya and Zambia, the project focused on stakeholder-identified services related to geohazards, water management and agricultural information. Companies in

multiple sectors will benefit from the services produced by project partners that include the Kenya Meteorological Department and the Ghana Agricultural Insurance Pool.

Initially, the project considered bathymetry – measuring the floor depth of a body of water – an intermediate outcome connected to reservoir management. But measuring water depth was of interest to many companies, and through efforts spearheaded by the University of Zambia, bathymetry emerged as an additional service focus.

## Innovative sensing solutions

TEMBO Africa uses a variety of technical resources to provide drastic cost cuts to water monitoring solutions. By introducing robust hardware with easily replaceable parts, the project has delivered inexpensive monitoring equipment. Project partner [SEBA Hydrometrie](#) with associated partner [photrack AG](#) developed three optical water monitoring tools (hardware and software).

For image-based observations, flow measurement systems were set up in Zambia and Ghana. These systems provide users with continuous measurements on water level, flow and discharge. Another camera-based system uses a [Raspberry Pi](#), and its main components are a camera, a power unit and a modem. An open-source software that runs on the ptBox OpenRiverCam has been developed by TEMBO project partner [Rainbow Sensing](#) for image-based measurements.



*Among the project's achievements is the first operational GNSS reflectometry service that measures water heights of large water surfaces by comparing GNSS signals sent directly from the satellite with signals that bounce off the water surface. There is no contact with the water, which makes this solution especially robust.*

## Leveraging global observation satellites

In addition to hardware solutions, TEMBO Africa also makes the most of satellite communications. Available to a range of private and public users, the international initiative [Global Earth Observation System of Systems](#) facilitates sharing the information collected from a global array of observers.

Such information includes data from global navigation satellite systems (GNSS), which provide the precise location of positions on Earth. "Among the project's achievements is the first operational GNSS reflectometry service that measures water heights of large water surfaces by comparing GNSS signals sent directly from the satellite with signals that bounce off the water surface. There is no contact with the water, which makes this solution especially robust," shares project coordinator Anna Gralka.

## Optimising creative partnerships

A goal of TEMBO Africa is making sure solutions are marketable and sustainable. Establishing local enterprises that can maintain water monitoring infrastructure is key. Working with [TAHMO](#) weather stations, TEMBO Africa ensures its solutions are embedded in an infrastructure well suited to the demands of the African environment.

Creative, flexible problem solving is central to the project's work. Speaking about installations at hydropower companies, Gralka states: "Each dam has its own particular challenges, from software legacies to specific physical settings. By organising co-creation sessions with individual power companies, we are able to rapidly ascertain what is needed."

Optimal solutions for improving water management services in Africa must be inexpensive, low-complexity and take advantage of the available resources. Using revenue generated by project-produced services, TEMBO Africa has already delivered several tangible results and has made hydro-meteorological data in Africa freely and openly available.

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### PROJECT

**TEMBO Africa - Transformative Environmental Monitoring to Boost Observations in Africa**

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### COORDINATED BY

TU Delft in the Netherlands

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### FUNDED UNDER

Horizon 2020 - Environmental Observation

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### CORDIS FACTSHEET

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### PROJECT WEBSITE

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By implementing its portfolio of programmes, CINEA plays a key role in helping the European Commission to advance economic development, enhance competitiveness, and protect environment and nature. The Agency is responsible for the entire grant management cycle of seven EU programmes that focus on transport, energy, climate action, nature, environment, and maritime fisheries and aquaculture.

CINEA's mission is to support stakeholders in delivering their projects through its high-quality management of programmes contributing to decarbonisation and sustainable growth. The Agency encourages and supports knowledge sharing and synergies across its programmes, from devising ideas to deploying solutions. CINEA enables strong partnerships between public and private stakeholders, leveraging more resources and boosting results.

The Agency's core activities include:

- selecting proposals for funding in line with the principles of transparency, objectivity and equal treatment;
- signing grant agreements and contracts, and closely monitoring the project portfolio;
- promoting EU programmes and Commission activities, and disseminating project results and success stories;
- feedback to policy by providing the Commission's services with timely and comprehensive information.

More details can be found on CINEA's website at: [cinea.ec.europa.eu/index\\_en](https://cinea.ec.europa.eu/index_en)

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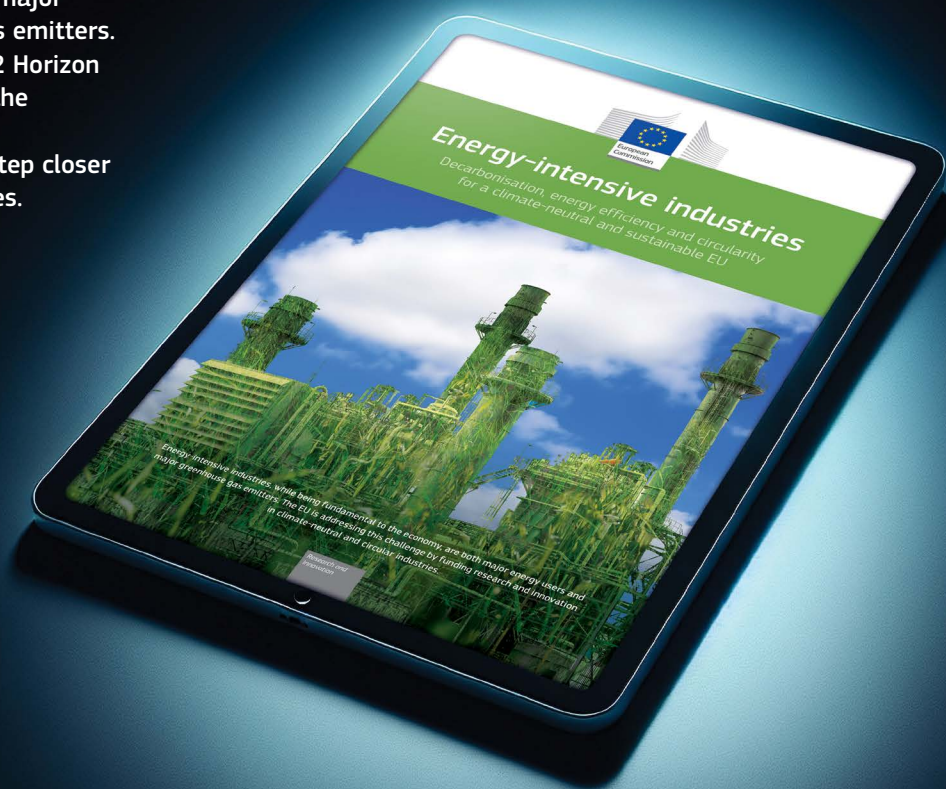
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## PROJECT INFO PACK ON ENERGY INTENSIVE INDUSTRIES

Energy-intensive industries, while being fundamental to the economy, are both major energy users and major greenhouse gas emitters. This CORDIS Results Pack focuses on 12 Horizon 2020 research projects, funded within the SPIRE partnership, that demonstrate technological pathways taking us one step closer to climate-neutral and circular industries.



Check out the Pack here:  
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