

ALBATROSS

**Advancing knowledge for
climate adaptation through
Climate Services and
Nature-Based Solutions**



**Funded by
the European Union**

Funded by the European Union under G.A. NO 101137895. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the European Commission can be held responsible for them.



ALBATROSS

Advancing knowledge for Long-term Benefits
and Climate Adaptation through Holistic Climate
Services and Nature-based Solutions

European-African consortium of 18 partners:

7 European Universities and Research Institutes

6 African Universities and Research Institutes

2 NGOs, 3 SMEs



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



Coordinators' corner



**Laura Leo,
Silvana di Sabatino**
(coordinator & co-coordinator)
University of Bologna

In its first 18 months of implementation, ALBATROSS has made significant progress in co-creating locally tailored climate adaptation strategies across Sub-Saharan Africa. A cornerstone of this success lies in the robust EU-Africa partnership that underpins the project, fostering close collaboration between institutions, experts, and communities across both continents. This cooperative model not only enhances the project's relevance and impact on the ground but also ensures that African priorities and knowledge systems are fully integrated into the research and innovation process.

The ALBATROSS consortium brings together a multidisciplinary group of experts in climate science, social sciences, policy, and community engagement. Their combined expertise enables the development of locally adapted methodologies to monitor, predict, and address climate impacts, while also supporting the integration of adaptation strategies into education, policy, and planning. Key partners ensure that scientific outputs are translated into actionable frameworks, promoting evidence-based policies and sustainable solutions at subnational and national levels.

ALBATROSS: Advancing knowledge for climate adaptation through climate services and nature-based solutions

ALBATROSS is an initiative funded within the Horizon Europe programme underpinning the EU-Africa partnership, since it unites forces of 18 European and Sub-Saharan African partners in a consortium to enhance climate resilience. Its objective is to accelerate climate adaptation in five Sub-Saharan African countries by developing user- and need-tailored guidelines, climate services and nature-based solutions that will aid decision-makers, local communities and relevant stakeholders in designing and implementing sustainable and effective local and national climate change adaptation measures and plans.

ALBATROSS has set up the so-called Climate Resilience Development Network (CRD Network) in seven regions of five countries: Ghana, Kenya, Tanzania, South Africa and Madagascar. To mark the beginning of these research activities and to initiate dialogue with local communities and national stakeholders, a series of national and local launch events are being held in the seven regions, namely the seven Albatross Hubs. These events aim to celebrate the start of the ALBATROSS project and foster collaboration among the various actors involved.

Sub-Saharan African countries face a high degree of vulnerability to climate change and weather-related disasters, with severe consequences for safety, water and food security, further exacerbating poverty and inequality. Climate-related pressures are also driving internal migration and urbanisation, increasing exposure to risks in low-income settlements. These challenges are compounded by both climate- and human-induced ecosystem degradation and biodiversity loss, which diminish the ecosystem services that many communities depend on.

In this context, governments and policymakers—particularly in Sub-Saharan Africa—face the complex challenge of developing and updating local and national policies that can effectively and simultaneously address these interconnected issues. Nature-based solutions, including protection, restoration, and sustainable management practices, are increasingly being implemented. However, their long-term effectiveness can be undermined by the changing climate. To ensure the resilience of these solutions, tailored climate services must support decision-making for both short-term actions and medium- to long-term planning.

ALBATROSS has developed a structured approach to guide each hub through a sequence of decisions toward climate-resilient nature-based solutions. This strategy centres on integrating climate services into nature-based initiatives to benefit both people and ecosystems.

ALBATROSS follows a bottom-up approach, maintaining continuous engagement with local communities, stakeholders, agencies, and decision-makers as a foundation of its methodology. This enables the project to tailor its interventions based on real, locally identified needs. As a result, a broad range of initiatives has been designed for implementation across the hubs—ranging from support for managing or enhancing existing nature-based solutions, to technical assistance, to the creation of new solutions from the ground up. These include complex agroforestry systems that strengthen climate resilience, biodiversity, and livelihoods, as well as mangrove restoration in areas severely affected by coastal erosion.

NbS at CRD Hubs: In a Nutshell

KUMASI - Ghana

NbS supported: Protection of urban wetlands and riparian zones.

Intervention: Implementation of a toolkit to promote citizens' report of encroachment and illegal use of wetlands, to support decision-making.

KETA BASIN - Ghana

NbS supported: Mangrove restoration and woodlots.

Intervention: Enhance the community management of Mangroves and Woodlots by the integration of climate services.

UMZIMVUBU - South Africa

NbS supported: Sustainable rangeland management and climate-smart agricultural practices.

Intervention: Development of climate services for NbS planning and management.

TURKANA - Kenya

NbS supported: Climate-smart agriculture, pasture reseeding and riparian restoration.

Intervention: Technical support and capacity building to communities

KIGAMBONI - Tanzania

NbS supported: Mangrove conservation, beekeeping, and seaweed farming.

Intervention: Community engagement and capacity building for replication and establishment of NbS.

TAMATAVE - Madagascar

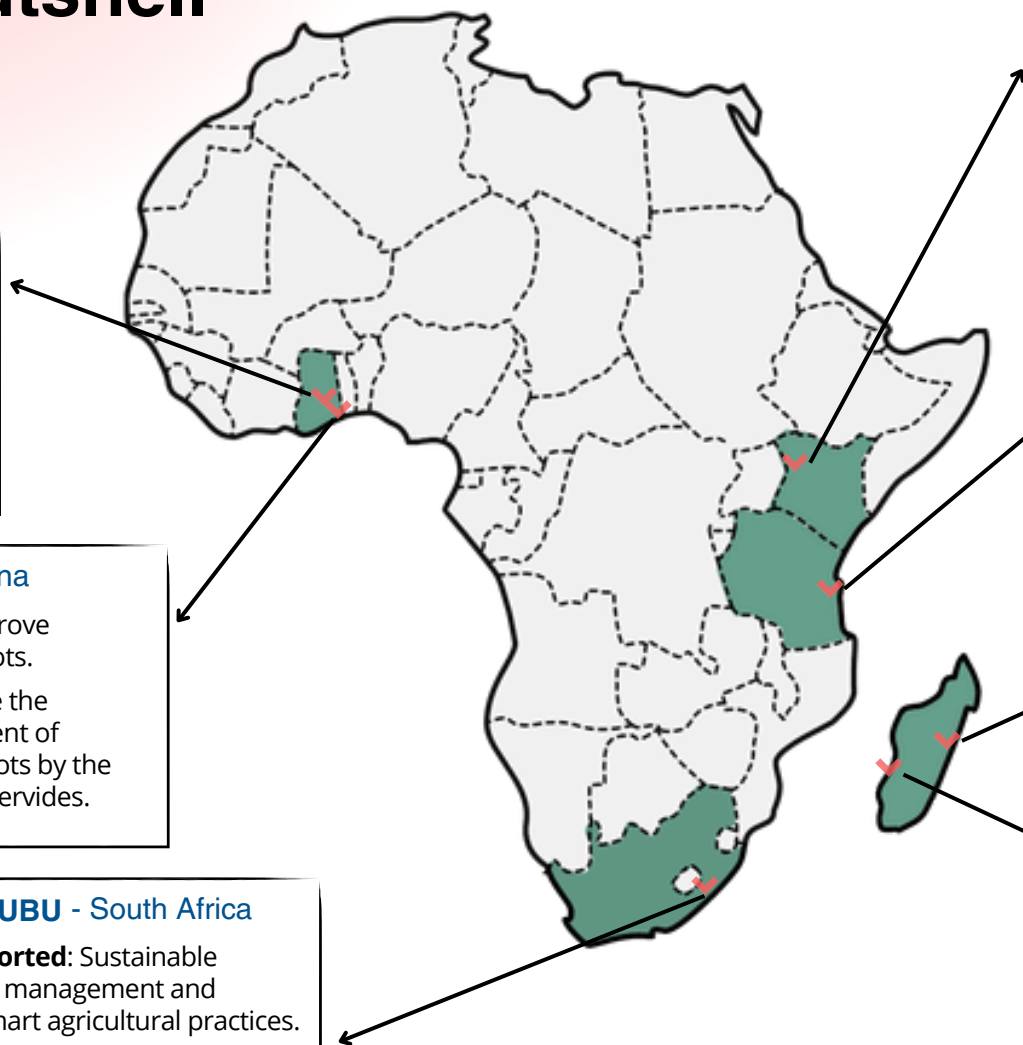
NbS implemented: Complex agroforestry systems.

Intervention: 200 hectares of soil restoration with diverse native species, providing ecological, cultural and economic benefits.

MORONDAVA - Madagascar

NbS implemented: Mangrove restoration.

Intervention: Restoration of 100 hectares of mangroves and training of local communities on efficient mangrove planting.



Tamatave

Located on the east coast of Madagascar, the city of Tamatave is rapidly growing, the second most populous city in the country, and an important economic and industrial centre. This causes an influx of migration to Tamatave, driven by poverty, food insecurity, and environmental degradation in the rural areas.

With the aim of enhancing climate resilience, biodiversity, and local livelihoods, nature-based solutions have been co-developed with farmers in the area, consisting of **complex agroforestry systems**, tailored to the local ecological conditions and farmers' uses, prioritising native tree and crop species. This combines ecological restoration based on the regenerative process of soil and biodiversity with economic benefits, reinforcing household resilience to market and climate shocks. The agroforestry systems integrate perennial cash crop trees (e.g. coffee, cacao), fruit trees (e.g. jackfruit, mango), native timber and medicinal trees (e.g. *Terminalia*, *Ravenala*), and forage species. Comprehensive socio-economic, botanical, and ecological monitoring of all 200 systems will ensure the viability and sustainability of the developed agroforestry systems.

Complementary to the nature-based solution activity, participatory climate services with **low-cost weather and hydrometric sensors** are installed on farmer plots, farmers becoming producers of real-time climate data. This will lead the development of simplified tools for day-to-day farmers' decision-making.

At the seasonal scale, tailored climate services for predicting precipitation and irrigation needs are being co-developed by the Albatross team in collaboration with local stakeholders, which will support anticipatory decision-making and long-term climate adaptation strategies in the Tamatave area.



Hub coordinator and main implementer of interventions:

Bôndy International

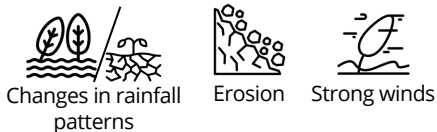
Geographic area:

East coast of Madagascar

Regional climate:

Tropical rainforest (Af)

Main meteorological hazards:

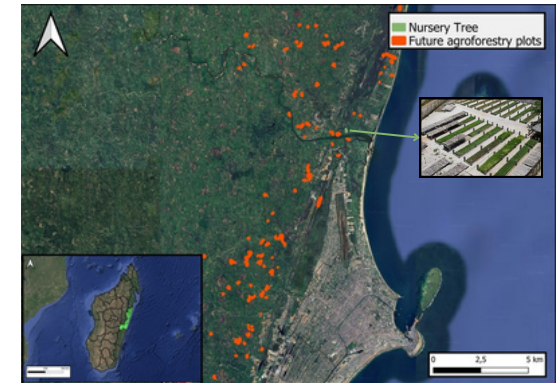


Interventions to date:

- 200,000 tree seedlings in production in the nursery.
- First low-cost weather station installed.
- 150 farmers trained on agroforestry.
- 60,000 trees already planted with 50 pioneer farmers.

Expected benefits:

- 200 farmers' livelihood diversification and economic resilience, including training and awareness raising in the community.
- 200 ha of soil restoration, carbon sequestration, shade, wind protection, reduction of erosion and runoff with in-situ conservation of biodiversity and local knowledge.
- Development of a locally-rooted climate data system, by deploying additional farmer-operated sensors.
- Launch of an accessible climate database, specific crop calendars and alert system for farmers and communities.



Morondava

Located in the southwest region of Madagascar, Morondava district sits on a very low, sandy maritime plain. The community relies on natural resources, such as agriculture and fishing, as well as mangrove crabs and gastropods harvesting, for both livelihood and income.

In response to the level of degradation of the area under study, the approach in this hub is the restoration of 100 hectares of mangroves. Due to coastal erosion, wide areas supposed to be mangroves are sand-covered, therefore preventing mangrove plants from properly prospering. Community members, mainly women, have to cross these sandy areas to reach mangroves, where they can harvest crabs and gastropods, essential for their livelihood.

In addition to the mangrove restoration intervention, local community members have also been trained on efficient mangrove planting, which will allow them to become resilient to the continuous erosion exacerbated by climate change.



Geographic area:

South-west coast of Madagascar

Regional climate:

Tropical wet and dry or savanna climate (Aw)

Main meteorological hazards:



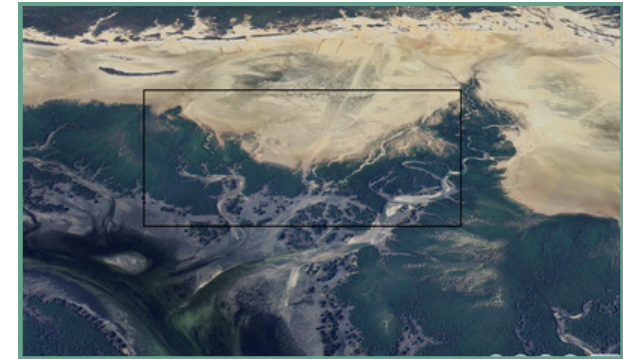
Coastal erosion

Interventions to date:

- Identification of the area to be restored.
- Installation of the mangrove plant nursery.
- 192 jobs (days of labour work) created during the implementation of the nursery (71 people employed).

Expected benefits:

- 100 ha of mangrove restoration.
- 2,594 daily wage labor opportunities created during the whole implementation of the intervention.
- 4,625 direct beneficiaries (Antsira, Marofihitsa and Belo sur Mer neighbourhoods).



Hub coordinator and main implementer of interventions:

UNESCO & OXFAM South Africa



Keta basin



The Keta Basin, located in the south-eastern part of Ghana, is a densely populated region characterized by coastal plains primarily drained by the Volta River. The area is experiencing both population growth and increasing urbanisation. Agriculture —particularly vegetable farming and fisheries—constitutes a major part of the local economy.

Nature-based solutions such as mangrove restoration and the establishment of community woodlots for alternative fuelwood are actively being implemented by community members. In response to the priorities identified through engagement with local stakeholders, ALBATROSS is supporting the integration of climate services into the planning and management of these interventions. A key focus is the development of reliable weather forecasts, seasonal outlooks, and climate projections. These tools will be translated into local languages and complemented by training, enabling communities to interpret and apply climate information effectively in the decision-making processes for sustainable nature-based solutions.



Geographic area:

South-eastern of Ghana, Western Africa

Regional climate:

Tropical wet-dry or Savanna (Aw)

Main meteorological hazards:



Coastal erosion



Coastal flood



Extreme heat

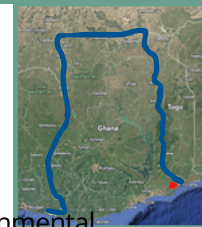


Interventions to date:

- Identification of the community needs for improving mangrove and woodlots management.

Expected benefits:

- Community members, students and government and non-governmental intermediaries are equipped with resources, including training, awareness-raising activities, and access to climate services, to support climate-smart strategies for mangrove restoration, coastal protection, and sustainable agriculture in community woodlots.



Hub coordinator and main implementer of interventions:

University of Ghana



Kumasi

Kumasi is the second largest and fastest growing city of Ghana (5.47% per year), and serves as an economic hub for the entire region. It receives an influx of migrants from various parts of Ghana and West Africa, resulting in rapid urbanisation and the development of informal settlements. This area suffers from floods, especially flash floods that cause settlement flooding, particularly affecting marginalised groups.

As part of the ALBATROSS project, a novel digital tool—the Citizen Science Toolkit—has been developed for use across all seven project hubs. It is designed to support community-based environmental monitoring and climate adaptation, with each hub tailoring its use to local priorities. In Kumasi, the toolkit is planned to be piloted to address specific urban challenges related to flooding, wetland degradation, and green space loss.

In collaboration with the Ghana Meteorological Agency (GMET), the National Disaster Management Organisation (NADMO), the Ghana Hydrological Authority, and the Land Use and Spatial Planning Authority, the Kumasi Hub plans to use the toolkit to support the protection of existing nature-based solutions, such as urban wetlands and riparian buffer zones.

The toolkit will enable citizens to report blocked drains, as well as encroachment and illegal or unapproved use of wetlands, with geotagged alerts. Similarly, illicit tree felling or destruction of green areas can also be reported by communities. Verified alerts will guide authorities in taking timely action and support site-specific decision-making.

The intervention by ALBATROSS also includes training for both planning authorities and citizens on the toolkit functionalities and application. This will also increase climate literacy and stakeholder participation in planning decisions.

Hub coordinator and main implementer of interventions:

Kwame Nkrumah University
of Science and Technology, Kumasi



Geographic area:

Southern Ghana, Western Africa

Regional climate:

Tropical wet-dry or Savanna (Aw)

Main meteorological hazards:



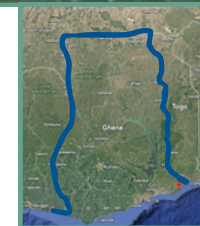
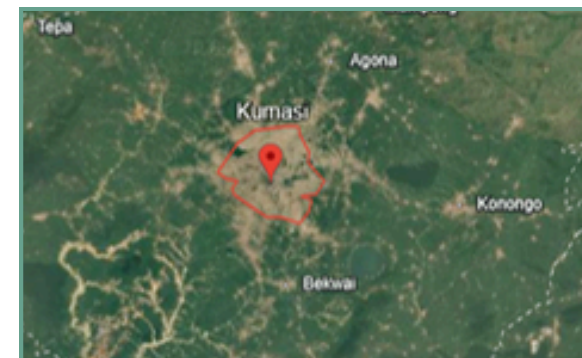
Urban flood

Interventions to date:

- Development of the Citizen Science Toolkit functionalities.
- Stakeholder engagement ongoing.
- Training for authorities to be completed as a next phase.

Expected benefits:

- Reduced flood risk through the protection of urban wetlands and riparian buffer zones, enhancing natural water retention and supporting urban food security in areas used for vegetable farming.
- Increased climate literacy, stronger stakeholder engagement and stewardship of urban NbS, and enhanced local capacity and inter-agency coordination for climate-resilient city landscape planning.



Turkana

Turkana County is located in the northwestern region of Kenya. The predominant livelihood system for the Turkana community is pastoralism—extensive livestock production that relies on the communal use of nomadic natural resources and is highly dependent on the availability of water and pasture, both increasingly affected by droughts and extreme heat.

A variety of nature-based solutions (NbS) are being implemented in Turkana County. These include climate-smart agriculture integrating drought-resistant trees; pasture reseeding through rotational grazing and the reintroduction of native grasses to restore degraded rangelands; and riparian restoration using indigenous vegetation to stabilise ecosystems and support biodiversity.

In collaboration with the county government, ALBATROSS is providing technical support to address the daily challenges faced by local communities and to assist in reviewing and refining the county's climate change adaptation plan. This includes, for example, guidance on managing invasive plant species (e.g. *Prosopis juliflora*) and agricultural pests that are impacting certain areas of the county.

To complement its technical support for NbS, ALBATROSS is also working on the establishment of a centralized climate data repository in Turkana. This platform will enhance community access to vital information—such as rainfall, humidity, and temperature data—to inform and strengthen the implementation of local nature-based solutions.



Hub coordinator and main implementer of interventions:

University Of Nairobi

Geographic area:

Northwestern of Kenya, North Eastern Africa

Regional climate:

Arid hot desert (BWh)

Main meteorological hazards:



Drought



Extreme heat



Interventions to date:

- Strengthening a participatory scenario planning process that brings together indigenous knowledge from local seers and elders with scientific expertise to guide NbS for sustainable rangeland restoration and conflict-sensitive grazing management.
- Continued engagement with County Steering Group and community for effective monitoring, data collection and feedback on user needs.

Expected benefits:

- Pastoralist communities benefit from NbS that restore degraded rangelands and riparian zones and improve ecosystem resilience.
- Governance and coordination mechanisms are strengthened through participatory planning, integration of Indigenous knowledge, and support for climate-resilient land and water management aligned with existing NbS initiatives.

Kigamboni

Kigamboni Municipality is situated along the coast of the Indian Ocean, and it is one of the five municipal councils of Dar es Salaam City, one of the fastest-growing cities in Africa. Owing to its proximity to the city centre, the Kigamboni area is also rapidly transforming.

The area faces high mangrove depletion rates due to the harvesting of wood for firewood, charcoal, and construction materials. This degradation has significantly weakened the natural coastal buffer, increasing the area's vulnerability to coastal erosion and flooding—especially during storms and periods of heavy rainfall.

To address this, the hub is promoting sustainable alternative livelihoods that reduce pressure on mangrove ecosystems, by implementing continuous consultation and capacity-building activities, particularly targeting youth and women. These alternatives include sustainable beekeeping and seaweed farming, which offer viable income sources without degrading natural resources. Seaweed farming also contributes to coastal protection and improved water quality, indirectly supporting mangrove health.

In parallel, the hub is working with key stakeholders to replicate and scale up existing examples of community-led mangrove restoration already active in the area.. This effort includes the co-development of funding proposals, such as one being prepared for submission to the Tanzania Forest Fund, aimed at supporting mangrove restoration and expanding sustainable beekeeping activities. These initiatives contribute to ecosystem-based adaptation, enhancing the resilience of both coastal communities and marine ecosystems.



Hub coordinator and main implementer of interventions:

Ardhi University

Geographic area:

Eastern of Tanzania, South Eastern Africa

Regional climate:

Tropical wet-dry or Savanna (Aw)

Main meteorological hazards:



Storm tides

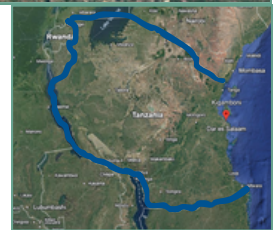


Coastal erosion



Interventions to date:

- Technical support for the plantation of 150,000 mangrove trees on an area of 250 acres in Mjimwema and Vijibweni
- 330 low-cost beehives installed within the mangrove area
- 76 community members trained on beekeeping and mangrove restoration and conservation.
- 4,000 kilograms of honey produced annually by the community members and sold



Expected benefits:

- 150 community members' livelihoods enhanced and economic resilience built, including capacity building in managing community projects.
- Establishment of mangrove nursery and replanting of 30000 mangrove trees; wind protection, increase of beehives; and control of coastal erosion.
- 600 beehives to be installed that will increase honey production to 12,000 kilograms annually; increase employment and income diversification, especially for the youth and women.
- Installation of a low-cost weather station and bee-queen production centre for enhanced NBS and related livelihoods.

Umzimvubu

The drainage basin for the Umzimvubu River is located along the northern boundary of the Eastern Cape and includes ten local municipalities. Northern uplands and central areas are mostly covered with grasslands (~70% of the area), and they represent a key biodiversity hotspot for their terrestrial and aquatic ecosystems. Livestock rearing and small-scale agricultural activities are key sectors in this area; however, drought and invasive species encroachment reduce water availability for crops and livestock, while intense rainfall causes flash floods, water contamination, and soil erosion. Overgrazing further increases vulnerability.

In this context, ALBATROSS carried out baseline assessments with 45 participants in the Matatiele area, including planning with various climate information and service providers from the Umzimvubu Catchment Partnership (UCP), to integrate climate services with specific needs. Community-based organisations, NGOs, public and private sectors, research institutions, as well as members of the local community, including traditional authorities and healers, were engaged. They explored sustainable rangeland management strategies—through the responsible use of natural resources and the removal of invasive alien species—and sustainable agricultural practices that incorporate indigenous plant species to support environmentally friendly and climate-adapted livelihoods.

A key focus of the ALBATROSS project in the Umzimvubu Catchment is ensuring that climate information—particularly related to rainfall extremes and flood risk—is meaningfully embedded into the planning and management of nature-based solutions. This involves aligning seasonal forecasts and long-term projections with the practical decisions that communities and land managers make on rangeland use, crop planning, and erosion control, helping to reduce flood vulnerability and protect agricultural productivity. A climate service to support this integration is currently being co-developed with the community.

Geographic area:

Eastern South Africa, East Southern Africa

Regional climate:

Temperate to sub-tropical, with high rainfall and cold in winter

Main meteorological hazards:



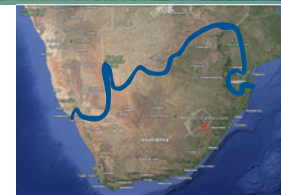
Floods



Droughts



Wildfires



Interventions to date:

- Baseline assessments and surveys engaged over 100 stakeholders to integrate climate services into NbS and sub-national planning, identifying local needs, gaps, and sustainable rangeland management.

Expected benefits:

- Engagement with 87 stakeholders in Matatiele (approx. 4,350 km²) to support the development and training on climate service tools.
- Empowerment of communities and especially several young 'Eco-Champions' and specifically women working in the Matatiele area through access to seasonal impact forecast tools tailored to local environmental and livelihood conditions.
- Improved preparedness for climate-smart agricultural practices and nature-based solutions (NbS), guided by timely and relevant climate information.
- Reduction of climatic and social-ecological threats through informed decision-making and enhanced resilience at the community level.



Hub coordinator and main implementer of interventions:

University of Cape Town