KADI

Report on activities towards the global observation system

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Executive Summary

The KADI project is dedicated to strengthening Africa's climate resilience by developing a pan-African research infrastructure for climate services. A core objective is to ensure that its scientific advancements engage with, inform and influence international climate policy. This report highlights the achievements in international policy cooperation and the strategic sharing of project outputs with a global audience. These outcomes and activities demonstrate KADI's bridge between science and policy.

The task related to Deliverable 5.2 aims to engage with and share the project results with the international observation community to ensure the integration of the African research infrastructure into the global system. The strong connections of some project partners with the World Meteorological Organization (WMO) and the Global Climate Observing System (GCOS) supported this task.

The policy level was engaged, leveraging ICOS ERIC's observer status to the UNFCCC to deliver key messages to the Paris Agreement bodies (SBSTA and COP). The task contributed to relevant meetings of WMO, IG3IS, and GCOS, particularly those aligned with WP2 pilot topics. The project was also showcased in side events at COP meetings.

The project contributed to the global climate agenda COP27 and COP28 on systematic greenhouse gas observations and transformative climate services. They also engaged in UNFCCC Subsidiary Body meetings to advocate for integrating robust observation systems into frameworks like the Global Stocktake. In addition, KADI consistently promoted equitable research resource distribution and ethical infrastructure design that incorporates African perspectives.

KADI played a central role in responding to a critical decline in the global ocean CO_2 observing network. Efforts culminated in the Ostend Declaration, a community vision for a sustained Surface Ocean CO_2 Observing Network (SOCONET). KADI facilitated training workshops in South Africa and Morocco, establishing a nucleus of African "regional champions" and ensuring that African researchers are leading contributors to this vital global system under the Global Ocean Observing System (GOOS) and WMO's Global Greenhouse Gas Watch.

The project's mission and results were promoted at premier scientific events to influence both the research and policy communities. This included presentations at the European Geosciences Union (EGU) General Assembly, the One Ocean Science Congress (OOSC 2025) ahead of the UN Ocean Conference, and the Wepal-Quasimeme Workshop and the World Climate Research Programme's (WCRP) Open Science conference with contributions to the resulting Kigali declaration. These engagements highlighted KADI's work on marine carbon monitoring, data gaps, and the need for sustainable, inclusive observation networks in Africa, directly linking them to European and global ocean observing strategies.

A bottom-up, stakeholder-driven methodology was developed to identify Africa's specific climate service needs and gaps. Through online workshops, pilot activities, and the KADI Annual Meeting in Nairobi, this approach ensured that the envisioned research infrastructure is grounded in local priorities. These co-created needs are now a foundational strategy for designing a pan-African infrastructure and are being integrated into global policy discussions, including at the WMO-IG3IS-ICOS Urban Greenhouse Gas Summit.

The project leveraged and strengthened existing partnerships with key international organizations including the World Meteorological Organization (WMO), the Global Climate Observing System (GCOS), GEO, AfriGEO, Euro-Argo, and ICOS ERIC. Previously established links with the Group on Earth Observations (GEO) and the African Group on Earth Observations (AfriGEO) were strengthened. These collaborations

were instrumental in amplifying KADI's messages, ensuring alignment with global frameworks, and facilitating the entry of project outputs into high-level policy discussions.

KADI has positioned itself in the international climate policy landscape. By strategically engaging with policymakers, contributing to global scientific initiatives, and advocating for equitable and sustainable observation systems, the project ensures that African data and voices directly contribute to global climate action, transparency, and evidence-based policymaking.

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Introduction

Research, particularly designed to address global challenges like climate change, must go beyond generating knowledge. It should actively shape policies that drive impact. Scientific findings need to inform decision-making at local, regional, and international levels.

Maximizing Impact Beyond Academia

Scientific research alone does not automatically translate into policy action. A structured policy engagement strategy ensures that project outcomes reach key stakeholders: governments, international bodies, and regional organizations where they can influence climate adaptation, mitigation, and sustainability frameworks.

This research can support alignment with global agendas such as by contributing knowledge and outputs relevant for international commitments such as the Paris Agreement, the Sustainable Development Goals (SDGs), and goals under the Global Climate Observing System (GCOS). By engaging with relevant policy bodies, research ensures its relevance and supports evidence-based policymaking.

Strengthening Stakeholder Buy-in

Policymakers, Non-Governmental Organizations, and industry leaders need accessible, actionable insights to strengthen buy-in. Dialogue to this end can be facilitated through participating in Targeted meetings, organizing and participating in side events at major conferences and registering for Observer status in key forums. This builds trust and ensures long-term adoption of project recommendations.

Policy influence helps institutionalize research outcomes and supports sustainability of outcomes beyond project funding cycles. It is a critical bridge between science and action. By embedding policy engagement into project design, research initiatives ensure their findings contribute to tangible, lasting change. This approach aligns scientific excellence with real-world policymaking, amplifying the project's reach and legacy.

The KADI (Knowledge and climate services for African Development) project, funded under the EU Horizon programme, recognizes the critical role of policy engagement in advancing climate action and sustainable development in Africa. Through a dedicated work package, the project has leveraged strategic partnerships and policy cooperation to amplify the impact of KADI's initiatives on the global stage.

The key to this effort is the strong connections of the Kenya Meteorological Department (KMD) and other consortium partners including SAEON, MeteoSwiss, University of Pretoria, Centre for Hellenic Research, NORCE, with leading international organizations such as the World Meteorological Organization (WMO), the Intergovernmental Panel on Climate Change (IPCC), the Global Climate Observing System (GCOS) and others. These linkages ensure alignment with global climate frameworks and facilitate the integration of KADI's outputs into policy discussions. Additionally, ICOS ERIC's observer status with the United Nations Framework Convention on Climate Change (UNFCCC) has provided a unique platform to deliver targeted messages to the bodies of the Paris Agreement, including the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Conference of the Parties (COP).

To ensure policy is informed by the work done under KADI, Consortium members actively engaged in high-level meetings of WMO, IG3IS, and GCOS, particularly those addressing themes relevant to the climate service pilots. Furthermore, members contribute to side events hosted by ICOS at COP meetings, fostering dialogue among policymakers, scientists, and stakeholders.

To strengthen its outreach, the project has reinforced the interactions with the Group on Earth Observations (GEO) and its regional arm AfriGEO, building on established collaborations from previous Africa-focused initiatives. The project has also continued its contribution and participation in the International Conference on

Research Infrastructures (ICRI) held every two years, which is the major professional forum for the global research infrastructure (RI) community. Through these efforts, KADI ensures that its scientific advancements translate into actionable policy recommendations, supporting climate resilience and sustainable development across Africa.

The ocean biogeochemistry pilot has actively promoted the project's goals and outcomes through participation in key international consortia, including the Euro-Argo ERIC Management Board, EuroGOOS, and other European marine observation networks. Additionally, HCMR has facilitated engagement with African stakeholders by inviting them to KADI meetings and fostering high-level discussions with European and international organizations such as the European Ocean Observing System (EOOS) and the International Argo community.

Participation in Scientific Policy Events

HCMR presented KADI's activities and outcomes during Euro-Argo Eresearch infrastructureC Management Board meetings. Key discussion points included:

- Strengthening marine monitoring infrastructures in Africa, particularly along the Southeastern coastline, where observational gaps persist.
- Enhancing climate monitoring in the Southern Ocean and improving estimates of carbon cycles using the Argo float array.
- Identifying deployment opportunities for Argo floats in under-sampled regions, including the South Mediterranean Sea, South Atlantic, and southwestern Indian Ocean.

The Euro-Argo and International Argo communities expressed strong interest in expanding collaboration with Africa, particularly in South Africa, North Africa, and East Africa (Mediterranean Sea and Indian Ocean regions). A major focus was on leveraging Argo's capabilities for climate-related ocean monitoring. As the only global 4-D in situ marine observing system, the Argo program—particularly its biogeochemical (BGC) floats—provides critical data on pH, oxygen, nitrate, fluorescence, and backscattering. These measurements enable estimates of partial pressure of carbon dioxide (pCO_2), offering insights into the ocean's role in the global carbon cycle, especially in remote regions like the Southern Ocean.

Currently, approximately 75 BGC Argo floats operate in the Southern Ocean, compensating for limited ship-based observations, particularly during winter. Ongoing research aims to improve pCO_2 sensor accuracy, refine calibration methods, and develop better algorithms for data processing. Integrating additional datasets (e.g., shipborne measurements, remote sensing) will enhance Argo's capabilities and accelerate the adoption of pCO_2 sensors, advancing our understanding of ocean carbon dynamics. KADI's mission has been actively presented at international conferences, workshops, and policy forums as follows:

The KADI message was widely shared in several scientific and policy workshops, conferences, and events at the international level. One initiative was taking advantage of the project's second annual meeting in Nairobi in October 2024 to meet with stakeholders and discuss KADI's progress, results, and outlook based on the stage of the project implementation activities at the time (See figure 1).

- Specific discussions were held at the beginning of 2024 towards this meeting, and invitations were sent to UNEP officers based in Nairobi after consulting UNEP-MAP officers based in other countries represented in the project consortium.
- During the project's annual meeting in October 2024, discussions on KADI's progress and future challenges were facilitated at the networking event.
- The networking event (October 17th) saw participation from the Greek Embassy in Kenya, which expressed strong interest in supporting KADI's initiatives in Africa.

Figure 1. KADI Networking Event at RCMRD in October 2024

Wepal-Quasimeme Workshop (Southampton, March 2025)

The participation to the Wepal-Quasimeme workshop (https://www.wepalquasimeme.nl/en/¬wepalquasi-meme/show-page/update-workshop-quality-assurance-for-ocean-acidification-monitoring.htm) focused on several topics related to KADI's activities and outcomes.

- KADI's marine carbon monitoring activities were highlighted, with emphasis on the WP2 training course in Algoa Bay (March 2024).
- Discussions covered challenges in African coastal carbon observations, data management, and the need for sustainable marine observation networks.

EGU General Assemblies

At EGU 2023, the project was showcased with a poster titled 'Designing a pan-African climate observation system to deliver societal benefit through climate action: The KADI project.' The abstract presented the KADI project's goal to conceptualize a pan-African climate research infrastructure. The poster outlined how KADI would support global climate goals by enabling access to standardized data and fostering African-European collaboration.

The early results of the 'Lessons Learned' pilot in Kenya were presented at EGU 2024. Through the pilot in Kenya and extensive stakeholder engagement, KADI identified data gaps and user needs to build a long-term, user-driven observation system. The early results stressed the importance of standardized data, institutional commitment, and knowledge exchange through collaboration. In the same conference a general overview of the project was also presented in relation to designing a pan-African climate system for societal benefit and climate action.

At the EGU 2025 conference the project's efforts and experiences were presented with the topic 'Strengthening climate science for policy in Africa: Open Science, low-cost data collection, and multi-level policy integration'. It outlined that KADI emphasizes the importance of embedding climate services into governance frameworks by translating scientific data into actionable policies. The presentation highlighted how KADI aims to support African policymakers with localized, robust evidence to inform decision-making and strengthen their role in international climate negotiations.

The activities and mission of KADI were also promoted through HCMR's participation which focused on the special events organised by the ENVresearch infrastructure community.

- HCMR engaged in sessions on climate, hydrology, and marine research infrastructures, leveraging the ENVresearch infrastructure Booth to discuss KADI's role in African climate observations.
- Lunch-talk sessions highlighted KADI's contributions to global environmental research infrastructures.

One Ocean Science Congress (OOSC25, Nice, June 2025)

An international meeting in which the project was showcased at was the OOSC25 (One Ocean Science Congress) in Nice, France, in June 2025 (figure 2) prior to the 3rd United Nations Oceans Conference. These two events were the most important events of 2025 for both science and policy regarding ocean monitoring and preservation.

- An abstract titled "Towards an Integrated Ocean Monitoring System for Climate Action: Insights from the AMRIT, Euro-Argo ONE, and KADI Projects" was submitted in in Session 10: "Vibrant Science to Inform and Support Ocean Action" (Figure 2).
- Key discussions centred on sustainable, inclusive ocean monitoring in Africa and the need for EU and Member State support for initiatives like KADI in connection to the European Ocean Observing System (EOOS) vision (https://www.eoos-ocean.eu).The work is published in the conference proceedings (DOI: 10.5194/oos2025-657).
- HCMR also raised concerns about declining EU and U.S. funding for ocean science and its potential impact on African climate monitoring efforts. Among participants there was a positive stance upon projects like KADI and there was a common agreement that similar initiatives related to ocean monitoring and climate across Africa should be further enforced by the EU and Member States.

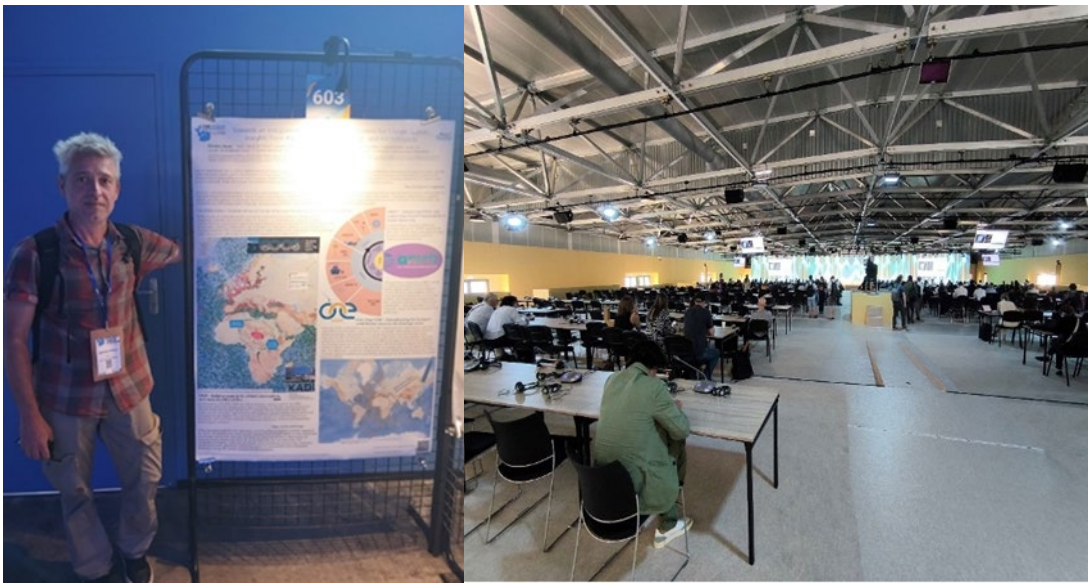

Figure 2. KADI at the plenary and at the poster session of the OOSC25, Nice June 2025

Engagements with the UNFCCC COPs, WMO and GCOs

As part of the KADI project, KMD has played a pivotal role in advancing climate policy by bridging the gaps between observations and global decision making. Through strategic engagements at UNFCCC COPs and June Subsidiary body meetings, KMD has championed the integration of robust observation systems into critical policy frameworks such as the Global stocktake, Global goal on adaptation and Loss and Damage Fund. KMD has contributed to the work of WMO, GCOS, AfriGEO and others to amplify Africa's voice in shaping transparency, early warning systems and urban monitoring initiatives – ensuring local data drives global action.

During COP27, a side event[1] on "Systematic observation of Greenhouse gases to support climate action in cities and regions" was co-hosted. The aim of the side event was to make the project known to high-level policy-makers and to enlarge visibility and engagement of other African countries. The side event underscored the critical role of systematic GHG observations in:

- Providing concrete, verifiable data for climate action at local, regional, and national levels.
- Improving the accuracy and transparency of national GHG inventories, which are fundamental for reporting under the Paris Agreement.
- Enabling more effective mitigation strategies by pinpointing emission sources.
- Supporting climate services that aid in adaptation and risk management, allowing cities and regions to better prepare for and respond to climate change impacts.
- Promoting the use of open and free Earth observation data, like that from Copernicus, to empower a wider range of stakeholders in climate action.

This event was part of a broader effort at COP27 to emphasize the importance of data-driven approaches to climate action, moving beyond broad commitments to more targeted and verifiable interventions.

[1] https://www.youtube.com/watch?v=WpW8bktu_z4

Figure 4. COP27 side event on systematic observation for GHGs for climate action in cities

Figure 3. COP28: Transformative climate services for decision-makers based on observational data

At COP28[2] KADI hosted a side event titled “Transformative climate services for decision-makers based on observational data”. The event explored through various panellists the role of transformative climate services in informing efficient climate mitigation actions. Drawing on their experience in the KADI project and other related work, the panellists shared their insights and experiences on co-designing and implementing climate services, showcasing African and European success stories as transferrable references. This side event allowed KMD and other KADI partners to highlight their work as well as how collaboration can serve to inform global policymaking.

International Conference on Research Infrastructures (ICRI)

KADI was represented at the 14th international conference on Research infrastructures on a panel session related to research infrastructure requirements in the next 30 years.

[2] https://www.youtube.com/watch?v=-MiOttUQHmI

The session demonstrated the need for ethically designing research infrastructures and inclusion of local stakeholders in climate monitoring and ensuring that African perspectives shape global frameworks. It highlighted the need for a fairer distribution of research infrastructure resources to address disparities between Global North and South, stressing the urgency of supporting African Meteorological Services. African research infrastructures were shown to be crucial in translating data into effective policies particularly for adaptation and for loss and damage assessments.

The panel also underscored the need for long term, open access data to inform UNFCCC processes, linking the standardized measurements by ICOS to policy accountability.

Figure 5. KADI at the 14th International Conference on Research Infrastructures (ICRI)

Participation at UNFCCC Subsidiary Body Meetings

KMD has continued to actively participate in the UNFCCC Subsidiary Body Meetings with contributions to the Research and Systematic Observation Negotiations Stream. KMDs participation has included;

To support technical advocacy for observation by emphasizing the integration of ground based and satellite observations into the Global Climate Observing System (GCOS) System. KMD has continued to emphasize that insufficient observations impact the quality of research and research infrastructures and subsequently evidence based policy formulation. KMD has been represented at all Subsidiary Body Meetings.

WMO-IG3IS-ICOS Urban Greenhouse Gas Conference and Stakeholder Summit 2025

At the summit jointly hosted by WMO's Integrated Global Greenhouse Gas Information System (IG3IS) and the ICOS Cities Project, KADI contributed insights on a collaborative approach to identifying climate service needs and shared lessons learned from the process. Discussions covered aspects of best practices, methodologies and challenges in stakeholder engagements and participatory knowledge generation.

Climate Chance Europe-Africa Summit 2025

KADI was presented at the Climate Chance Europe Africa Summit and contributed to the Marseille Declaration "*Strengthening Europe-Africa Cooperation on Climate Change Adaptation*" adopted during the event held on March 31st and April 1st, 2025. As an organising partner and signatory of the Marseille Declaration, ICOS ERIC affirmed its commitment to making high-quality data a foundation for equitable, global climate action. KADI aligns closely with the principles outlined in the Marseille Declaration, as both emphasize

the need for strengthened adaptation policies, enhanced Europe-Africa cooperation, inclusive stakeholder engagement in climate resilience efforts and a stronger voice for Africa[3].

Engagements with AfriGEO, GEO and the African Regional Forum for Sustainable Development (ARFSD)

Throughout the project, KADI has actively engaged with the Group on Earth Observations (GEO) and its Africa-centred counterpart, African Group on Earth Observations (AfriGEO).

KADI co-hosted a side event at the GEO Week and ministerial summit 2023. In addition, KADI sent an official statement and quote which is on the event web page. The statement and quote were related to co-design of climate services and tailored to support African policy-makers as well as linking in situ with remote sensing in Africa. It was emphasized that the ground-based measurements of in situ concentrations and fluxes of greenhouse gases (GHGs) in the atmosphere, on land and in the ocean are essential information for many communities in GEO, be they satellite experts for the calibration and validation of their observations, modelers for input in their predictions of climate trends, or developers to produce new tools based on EO data. From the discussion at the KADI side event it was clear that:

- Africa needs more than data; it needs strong collaboration and partnerships to effectively use existing data.
- Data efforts are often fragmented, limiting their impact. Improved data sharing and coordination are essential for broader applicability.
- Decision-makers must be engaged and sometimes trained to use data effectively for policy-making.
- Local involvement through co-design and collaborative design is crucial for developing climate services that are relevant and sustainable.

KADI contributed to the symposia of the African Group on Earth Observations in September 2023 and in 2024. The starting point was to revisit and revive previous connections to this community. The project has been presented with key messages that the following are invaluable:

- Enhancing collaboration and interoperability between in situ and remote sensing data.
- Prioritizing African ownership and collaborative design in climate service design.
- Promoting data sharing and open science.
- Fostering diverse collaboration across national, regional, sectoral, disciplinary, and institutional levels.

One significant takeaway is the fact that funding for knowledge sharing is a huge barrier to build human capital in Africa. The solution requires policy buy in - creating the space and being actively involved in knowledge sharing initiatives. KADI has also connected with the AfriGEO secretariat hosted by the Regional Centre for Mapping of Resources for Development (RCMRD). The discussions were centred around co-organizing or participating in training events. These have materialized with the hosting of the KADI annual meeting at the RCMRD premises in Nairobi in October 2024. KADI also actively participated in the RCMRD international conference in October 2024 addressing the following in a panel discussion via different discussion points:

- In Africa, the current state of data and infrastructure remains uneven, with significant gaps in accessibility, reliability, and capacity.
- Recent technical exchanges are helping to shift how data is collected and used, moving from isolated efforts to more integrated, cross-sectoral approaches.

[3] https://kadi-project.eu/kadi-contributes-to-the-marseille-declaration-for-strengthened-europe-africa-collaboration/

- Building communities of practice around data is proving essential for sharing tools, standards, and innovations, while knowledge exchange across countries and institutions plays a critical role in strengthening local expertise and ensuring data translates into practical action.

KADI attended the GEO Global Forum 2025 in the framework of ICOS as an observer in GEO. In the statement of ICOS at the GEO plenary, KADI was highlighted as follows: "*As a key element of the strategy of ICOS, the support to under-observed regions of the world also benefits from the links to members and participating organizations in GEO. ICOS activities in Africa are tightly connected to AfriGEO which represents a particularly relevant stage to engage with key partners in the region. GEO's efforts to improve in situ observations and climate services in Africa (e.g. in the TEMBO pilot) are perfectly in line with the objectives of the KADI project. KADI's aims to strengthen Africa's ability to generate, access, and use high-quality climate data and services aligns with GEO's vision for locally owned and globally integrated EO systems that advance inclusivity, empower users and support climate resilience*."
KADI will participate in the 9th AfriGEO symposium in October 2025 where the results of the project will be presented. The blueprint developed will be presented as the KADI Research and Knowledge Infrastructure structured across four domains: (i) operational data, ensuring sustained measurements; (ii) information, translating observations into usable outputs; (iii) knowledge, generated through engagement with diverse actors; and (iv) societal impact, realized through tailored climate services for adaptation, mitigation, and disaster preparedness. Cross-cutting elements like community engagement, collaborative design, open science, and competence growth ensure that services are both scientifically robust and socially relevant will also be discussed.
The project was represented at the 5th Africa Climate Talks at the 10th Session of the Africa Regional Forum on Sustainable Development (ARFSD-10) in April 2024. This article on the KADI website provides some the context and highlights of interventions from the project's perspective.

KADI Annual Meetings and Networking Events

During KADI's Annual meeting held in October 2023 in Kigali, KADI engaged with the Rwanda Space Agency and Mount Mugogo Observatory who had a segment at the annual meeting to present their activities. The main discussion was on the need for a climate observatory in Rwanda, knowledge exchange and training on the use and maintenance of measuring instruments. This was followed by a subsequent visit to the premises by KADI's coordinator. A series of discussions followed in relation to knowledge exchange, curriculum development by linking the observatory to networks like Una Europa.

The 2024 annual meeting included a strategic stakeholder meeting aimed at local actors, academia and the Regional Centre for the Mapping of Resources for Development. The progress on the work in KADI was especially in relation to contributing to decision-making and policy development at national, regional and global levels were discussed (See figure 1).

In August 2025, as part of a KADI city pilots training held in Dar es Salaam, a stakeholder workshop was held targeting local actors like the Resilience Academy, Tanzania Meteorological Agency, University of Dar es Salaam, Ardhi University, GIZ. The training participants were drawn from over ten African countries. The results of the project and possible next steps were discussed.

KADI WP2 pilot activities

Throughout all pilot stakeholder engagements, insufficient observation data and limited access to information emerged as primary issues requiring attention, with funding identified as a crucial factor for enhancing citizen science (climate services). Outcome of these engagement activities are expected to be disseminated through

a variety of mediums such as policy briefs, key messages and publications for adequate integration into global observation systems.

NORCE has played a leading role within recent efforts to enhance and stabilise the Surface Ocean CO2 observing system required to monitor and track the ocean carbon sink. The ocean assimilates about one quarter of the CO2 released to the atmosphere by human activity which slows climate change. This observing system, referred to as the Value Chain, consists of in-water observing systems measuring the partial pressure of CO2, data synthesis activities such as SOCAT, the surface Ocean CO2 Atlas, and finally the analysis of merged data products combining SOCAT and remote sensing data. This activity occurs every year and results in the submission of an estimate of ocean carbon uptake to the UNFCCC Conference of the Parties by the Global carbon project. In recent years, the geographical coverage of the ocean observing system has declined significantly, returning to levels comparable to those seen in the early 2000s, following a peak in 2017. This reduction in coverage has contributed to increased uncertainty in estimates of oceanic carbon uptake. Looking ahead, further disruptions to the observing network are likely, particularly due to developments in the United States, which currently operates approximately 50% of the data-contributing platforms.

The international community has been taking the following actions in response to this situation. KADI through NORCE contributes as follows.

1. In 2023, NORCE convened an international workshop in Ostend, Belgium, attended by several African researchers supported by KADI to develop an international community vision around implementing a surface ocean CO2 observing network (SOCONET) as part of the Global Ocean Observing System (GOOS). The results of this are summarised in the Ostend declaration which identifies the key actions the scientific community needs to take and the necessary response from funding agencies and policy makers to support this global ambition.
2. African researchers were trained to play leading roles within SOCONET, via an in person workshop conducted in South Africa. This was led by Abdirahman Omar (from NORCE) and Tommy Bornman (from SAEON)
3. KADI organized a webinar to build momentum for the engagement of African researchers in the SOCONET activity. This was attended by Oksana Tarasova who leads on the implementation of the Global Greenhouse Watch for WMO and by Maciej Telszewski who leads on the SOCONET activity within GOOS at the current time.
4. The Biogeochemistry pilot in KADI held a workshop in July 2025 in Casablanca to form the nucleus of an African contribution to SOCONET. This was attended by several regional ‘stakeholder champions’ from Morocco, Ghana, South Africa and South Africa. These stakeholder champions have agreed to form the nucleus of an African SOCONET committee which plans to move forward with developing a continental scale contribution to SOCONET.

Cross-Cutting Stakeholder Workshops

WP1 carried out a variety of stakeholder engagement activities aimed at guaranteeing a participatory need-driven approach to determine climate services needs and gaps in Africa, as well as necessary infrastructure to address these needs. Stakeholders provided specific climate service needs and advice on developing critical elements for a Pan-African research infrastructure to support useful, usable, and practical climate services across multiple sectors. The WP1 engagement methodology included three components: 1) KADI WP2 pilot activities, 2) WP1 Task 1.2 online workshop, and 3) KADI Annual Meeting 2024 stakeholder workshop. All these events targeted the stakeholders identified and linked from the different networks of the consortium members as part of the policy cooperation work package and other related tasks.

In these events, the work package 1 team delivered a presentation on collaborative design of climate service needs. In addition to sharing the collaborative design approaches, discussions were facilitated on the process of identifying and validating data and knowledge gaps, scoping stakeholder landscape and providing a holistic view of the need for a research and knowledge infrastructure in Africa.

KADI WP1 online workshop

Through this participatory and collaborative process, stakeholders from anglophone and francophone speaking countries across Africa and Europe were invited to share their experiences and views on climate services, current challenges and gaps, and ideal research infrastructures providing climate services. This approach facilitated the co-development of a shared understanding of the climate services needs that research infrastructures must address. The validation process ensures that service needs and infrastructure solutions are contextually relevant, effective, and aligned with local priorities. The outcome of these and other engagement activities are expected to inform the integration of the identified needs into the global observation systems.

An outcome from the WP1 climate services needs assessments, which revealed gaps in sector-specific climate services needs as well as regionally grounded climate vulnerabilities and priorities, have now been documented in a manuscript for publication.

KADI Annual meeting 2024: Key messages for policy and observation systems integration

- **Diverse and sustained funding is vital** to support Africa's climate observation infrastructure, complementing national efforts with alternative financing.
- **Regional cooperation hubs** can share knowledge and best practices, support research infrastructure operations, and provide training and knowledge exchange.
- **Engaging grassroots organisations** strengthens climate resilience by scaling up local successes.
- **Investing in youth education and training** prepares young professionals with relevant skills for operating networks, managing data, and using climate services.
- **Promoting gender and youth inclusivity addresses underrepresentation**, acknowledges specific risks, and leverages their roles in data work through targeted support and knowledge exchange.
- **A multipronged approach** to tackling Africa's climate data challenges requires a strategy blending government action with private sector solutions, citizen science, affordable tools, indigenous-led products, and co-produced investments.
- **Sharing local good practices**, such as reducing emissions through incentives, helps scale successful innovations.

KADI- LEAP RE Webinar

In January 2025, KADI hosted a webinar in collaboration with the Long-Term Joint EU-AU Research and Innovation Partnership on Renewable Energy (LEAP RE). The theme was 'Bridging Data and Action: Leveraging Greenhouse Gas Research to Drive Policies and Renewable Energy in Africa'. It was part of the efforts to strengthen the climate change component of the CCSE partnership. The webinar delved into the synergies between KADI and LEAP RE, emphasizing how data-driven approaches can inform policy-making and foster innovations essential for advancing sustainable energy and climate objectives. Experts from different sub regions and other projects, along with project partners, shared valuable perspectives on harnessing collaborative platforms and pioneering research to catalyse lasting, sustainable transformation.

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Summary

HCMR's contributions have strengthened KADI's visibility within key scientific and policy circles, fostering collaboration with the Argo community and advocating for sustainable ocean observation systems in Africa. Continued engagement with international partners remains critical to advancing KADI's mission and supporting global climate action.

Integration into the global observation system

The partners' leadership and participation in international forums demonstrates how African leadership can shape the international climate agenda through science based advocacy. By anchoring their work in partnerships, collaboration and targeted initiatives, KADI has not only shone a spotlight on Africa's climate observation infrastructure but also ensured its data can directly inform critical policy frameworks. Persistent gaps in financing and capacity however underline the need for deeper collaboration and south led responses to fill existing gaps.

The activities that KADI through NORCE have been able to support have led to a high level of engagement by African researchers within the general global effort to establish a more formally organised and structured observing network for surface pCO2 within GOOS and the Global greenhouse gas watch of WMO.

The KADI project has made significant strides in ensuring that Africa's climate research infrastructure is recognized and integrated into the global observation system. This effort is driven by the strategic engagement of key partners such as the Kenya Meteorological Department (KMD) and ICOS ERIC, whose strong connections with international bodies like the World Meteorological Organization (WMO) and the Global Climate Observing System (GCOS) have been instrumental.

International Scientific and Policy Engagement

- KADI actively participated in UNFCCC COP27 and COP28, hosting side events focused on systematic greenhouse gas (GHG) observations and transformative climate services.
- Through ICOS ERIC's observer status at UNFCCC, the project delivered targeted messages to the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Conference of the Parties (COP), ensuring African data informs global climate policy.
- KMD contributed to Subsidiary Body meetings, advocating for the integration of robust observation into frameworks like the Global Stocktake and the Loss and Damage Fund.

Strategic Partnerships and Networks

- KADI reinforced links with GEO and its regional arm AfriGEO, building on previous Africa-focused collaborations.
- The project co-hosted events at the GEO events, emphasizing the importance of co-designing climate services and integrating in situ and remote sensing data.
- Engagements with RCMRD and participation in AfriGEO symposia helped promote African ownership and knowledge exchange.

Scientific Contributions and Knowledge Exchange

- KADI supported the development of SOCONET, a global Surface Ocean CO_2 Observing Network, through workshops and training in South Africa and Morocco.

- African researchers were trained and positioned as regional champions within GOOS and WMO's Global Greenhouse Gas Watch.
- The project's WP2 pilots and stakeholder workshops identified critical gaps in observation data and infrastructure, informing global integration strategies.

Policy Influence and Knowledge Sharing

- KADI's bottom-up, stakeholder-driven approach ensured that African climate service needs are contextually relevant and globally interoperable.
- Participation in high-level forums like the International Conference on Research Infrastructures (ICRI), the WMO-IG3IS-ICOS Urban GHG Summit and the African Regional Forum on Sustainable Development were significant efforts towards amplifying Africa's voice in shaping climate governance.
- The project emphasized ethical design, equitable resource distribution, and the inclusion of African perspectives in global frameworks.

The project's bottom-up, need-driven, collaborative design approach to identifying climate service needs and gaps across Africa, serves as a foundational strategy for designing an effective Pan-African research and knowledge infrastructure. By actively engaging stakeholders in this process, the approach is expected to significantly strengthen the integration of Africa's climate services needs into global observation systems, as well as ensuring that infrastructure solutions are both contextually relevant and globally interoperable. Collaboration, collaborative design, funding and capacity enhancement are necessary to gain ground on the science-based foundation built during the project.