KADI

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# Executive Summary

In this document we summarize the key findings of the KADI project (from its inception till date) in relation to the how to support the cooperation between Africa and the European Union towards the establishing of an observation network in Africa. A reliable and comprehensive observation network providing climate services is vital for enhancing Africa's capacity to monitor, understand, forecast and respond to climate variability and change. This document presents recommendations towards establishing and maintaining a robust observation network, focusing on co-design, innovation, leveraging existing data collection and use, knowledge exchange, national, regional and international collaboration. The African Union (AU) and the European Union (EU) share common goals in addressing climate change and promoting sustainable development. Collaborative efforts between the two regions can leverage expertise, resources, and innovation to tackle climate challenges effectively. This document outlines recommendations to enhance AU-EU cooperation in climate research, focusing on knowledge exchange, capacity building, multi actor engagement, and support to open science. The recommendations are a combination of insights from engaging with different actors - the project partners and their networks; initial insights from survey results, meetings with collaborative networks and KADI participation at events.

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# Introduction

Considering cooperation frameworks of the African Union and the European Union, Task 5.3 ensures that the course of the project is aligned with the priorities of the European comprehensive strategy for an Africa-EU Partnership. For this document we refer to the Final Declaration of the 6th European Union-African Union Summit held in Brussels in February 2022. We also refer to the Africa Europe Foundation's most recent report on the progress made on the commitments in the declaration. The KADI project aims to serve as an example of cross-continental cooperation and to provide the AU and the EU with a foundation for an African observation network. The task ensures that the course of the project is aligned with the priorities of the European comprehensive strategy for an Africa-EU Partnership.This deliverable is prepared to support this cooperation with the insights from the work done in the project so far.  During the first reporting period, the coordination team at ICOS facilitated and established contacts with different stakeholders which have informed the writing of this document. In each section, we give a general overview, followed by the input from the work in KADI and related policy recommendations.

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## Support to open science

## Open science, low-cost data collection and sharing

Open science will play a crucial role in advancing effective climate services in Africa by promoting collaboration, transparency, and innovation. A major barrier to making full use of already existing climate services and related initiatives is the inability to openly access and use data within and across countries. The results from a survey on lessons learned from long term cooperation between meteorological services confirms the need for incorporation of real-time weather data into decision-making platforms, free and continuous and timely access to data; knowledge on confidence level of the information and regular training opportunities.

An opportunity in African cities with large digitally skilled young populations holds possibilities for "citizen sensors" where communities contribute to data collection by using their mobile phones and participatory online platforms. An example is the participation of young people to co-design and lead a clean air campaign that collected air quality data in Cape Town[1]. Participants wore low-cost sensors during community running events and shared the data with the public on an interactive platform.

Another example is the Resilience Academy in Dar es Salaam with its core approach involving university students to conduct community mapping with low-cost and mobile tools to collect critically needed geospatial data of hazards and the lived environment.

In line with promoting African solutions for African problems as outlined in the commitment 8 of the declaration of the 6th AU-EU summit, there is need for multi-level policy support and frameworks for sharing and replication of such people-based approaches across different countries. This implies the adoption of quality assurance and quality control (QA/QC), standardized formats and metadata protocols for climate data to enhance interoperability and data usability; supporting and encouraging data providers to adhere to open data principles, including transparency, accessibility, and re-usability. A specific focus should be given to a federated, long-term data infrastructure enabling the storage, archiving, exchange and provision of the data described above and data-related services.

## Knowledge exchange and training

One action point from the joint EU-Africa strategy is to rapidly enhance learning, knowledge, skills, research and innovation capacities. From the showcases and presentations at events, like the African Group on Earth Observations Symposium and the Group on Earth observations Week 2023, it is evident that there are several parallel initiatives developing or supporting the development of services to facilitate adaptation to the effects of climate change. Most of these initiatives are small scale and do not have sufficient resources for dissemination which could enable wider uptake of best practices. This can be improved by facilitating exchange programs for researchers, scientists, and policy-makers to share expertise, experiences, and best practices. It can also be addressed by promoting national, regional and cross-regional learning and collaboration through workshops, conferences, showcases and networking events.

To ensure that African researchers are enabled to perform cutting-edge research in different fields of environmental science, consideration should be given to investing in effective knowledge exchange and technical expertise. Their European counterparts can benefit from these exchanges from both 'conventional' and 'unconventional' knowledge transfer channels that exist in Africa. The review in KADI, defining climate service needs in the African context highlights that research infrastructures and climate services can tend to focus on "hard" infrastructure that provide high quality data but struggle to show impact to stakeholders, actors and the communities. Recent efforts have focused on the development of "softer" scientific infrastructures, prioritizing user spaces. Users of various climate services, both hard and soft infrastructures, include those that embrace social and cultural dimensions, the consideration of the roles of formal and informal institutional spaces, various sources and requirements of data and information (including local, tacit and indigenous knowledge) and economic infrastructural services for effective decision making. Key elements and principles of engagement in these 'soft' include relational engagements, trust building approaches and understandings, mutual respect and humility, appreciation of different world views and values and the ethics of climate services.

Investments are needed in capacity-building programs for meteorologists, climatologists, and other relevant professionals to enhance their skills in climate modelling, data analysis, and service delivery. This also means providing technical assistance and mentorship to support the development and implementation of climate services projects.

[1] https://urbanbetter.science/cityzens-for-clean-air/

It should be discussed between AU and EU whether a common curriculum of integrated climate sciences can be developed and applied by African universities with the support of European Universities. This would ensure the continuous education of climate scientists in Africa.

## Decision-making and policy coordination

One of the action points of the joint EU-Africa strategy is integration of good governance in action and in cooperation. African policy-makers need scientific evidence provided by African researchers under African conditions, which will increase their confidence in the science describing the changes in the continental climate. This will allow them to design efficient climate policies and actions, and will also reinforce their voice in international negotiation frameworks. For many stakeholders no delay is acceptable. Real-time information is needed otherwise their tasks within their organization are impeded. As seen from the information collected by the lessons learned pilot in KADI, a wide range of daily decisions, policy direction and activities depend on the weather, climate and atmospheric composition information (See figure 1 below). The results also reveal the need for more comprehensive and integrated data that caters to the needs of different actors in society.


*Figure 1: Decisions supported by weather, climate and atmospheric composition information*

## Funding innovations to widen and prolong the impact of results

As previously mentioned, sustainability and continuity are hampered by fixed term funding. The immediate solution is not necessarily new funding schemes, but integrating funding from different funding sources. This will not only increase the scope but also the size of resources towards a robust observation network in Africa. In this context, it is important to distinguish between investments to implement infrastructure which may be short-term and the long-term maintenance costs which should be ensured at the funding decision for investments. In particular here, there is a need to foster partnerships between governments, development agencies, private sector entities, and civil society organizations to mobilize resources and expertise for climate services. Public-private partnership can facilitate co-financing arrangements, technology transfer, and knowledge exchange, enhancing the effectiveness and sustainability of a climate observation network. This directly supports commitment 4 ('a prosperous and sustainable Africa and Europe') of the declaration from the 6$^{th}$ EU- AU summit.

It is also recommended to revisit the funding allocation processes to ensure diversity and inclusion of beneficiaries. For instance, in terms of disciplines, gender, countries and regions. If these are not built into the funding allocation mechanisms, well-known or frequent beneficiaries may continuously receive funding on the basis of trust and longer-term experience which may lead to the exclusion of lesser-known new and innovative solutions.

In Africa, policy should strengthen collaboration among African countries through south-south partnerships to share resources, experiences, and best practices in climate services. The AU-EU cooperation should facilitate joint funding mechanisms and knowledge transfer initiatives to support capacity building and innovation in this respect. In the KADI project, one pilot is supporting through a training of African scientists

from different African countries to be held in March 2024 in the Western Cape (St Helena Bay). The focus is on hands on training, low-cost sensors, etc. This course will include lectures, hands-on training, cruises and fieldwork, data analysis and management, and summing up including integration with international networks.

## African cities as complex, rapidly growing and changing spaces

In the KADI city pilots it is evident that African cities grow very fast and are not necessarily planned. For decision-making to be relevant to this context, there should be regulations to manage city infrastructure. There should be clear policy provisions and multilevel governance addressing the effects of climate change. This means access to the right data infrastructure to forecast, inform and empower the population to act on time. This will support commitment 8 of the declaration of 6th European Union - African Union Summit: A Joint Vision for 2030 which states, "*We welcome the fruitful discussions in the Round table Sessions on Financing for sustainable and inclusive growth; Climate change and energy transition, digital and transport (connectivity and infrastructure)….*" A related recommendation that has been built from discussions at the KADI side event in the GEO week 2023 and participation at the 7th AfriGEO symposium is the need for tailored climate-informed decision-making training for different levels of policy makers. This will also support commitment 4 where there is a statement committing to promoting opportunity oriented technical and professional vocational education and training.

## The sustainability and continuity gap

Purchasing, installing and maintaining standard observation equipment is resource-intensive and would not be the only choice for laying the foundation for an observation network in Africa. As shown above there are alternative approaches using low-cost sensors and people-based observations to complement them. In order to promote local ownership and sustainability, there is need for training in the use and maintenance of all observation equipment. However, during the pilot in Abidjan, poor spatial coverage of measuring instruments, affecting the representativeness of results, highlighted a problem that might be widespread. Even with adapted approach it might be difficult to achieve sufficient spatial coverage.

In the pilots and KADI's connection to observation communities, it is evident that continuity and maintenance of research infrastructure is not long term nor included in project plans. Maintenance of installed instruments and field costs for sample collection and laboratory analysis continue while projects end. Discontinuation also results in poor dissemination of results to politicians and raising their awareness, resulting in an insufficient planning policy and weaknesses in further access to funding. It is evident that long-term funding structures need to be established.

During the past year, KADI connected to the Mount Mugogo climate observatory in Rwanda and found similar issues.To overcome the maintenance problems due to the limited resources, KADI is linking the station to other relevant networks to facilitate the possibility for training and support of local expertise to use and maintain the instruments. For the AU-EU cooperation a policy recommendation is to make provisions for connecting already existing observation communities and stations established from previous projects to cross-benefit from existing expertise. Another path towards sustainability is to connect the initiatives to their European partners for knowledge exchange on maintenance and use of instruments even after the projects have ended.

## Multi actor engagement to build a community of practice

It is not news that the African context is yet to be sufficiently studied and integrated into the global GHG discussions. It is also not news that the African context is quite varied between and even within countries. In other to establish a robust observation network there is a need to bring as many relevant stakeholders to the table as possible. This will ensure building a community of practice that is as representative of context realities as possible. To ensure this, the work in KADI includes identification of key sectors and stakeholders, and their climate service needs which are up-to-date and based on contextual understanding, existing, knowledge gaps, and resources. Commitment 8 of the 6th EU – Africa summit recognizes the contributions of different stakeholders. The section lists youth, civil society, local authorities and the private sector. It is recommended that policy cooperation between the AU and EU should envision increased trans-disciplinary, multi-sector and most especially science-society collaboration to identify and find solutions to climate adaptation needs.

## Conclusion

The need for integration and long-term approaches in funding, knowledge exchange, policy support, data sharing and training is crucial in the efforts towards designing an effective climate observation network in Africa, by Africa and for the African contexts. Africa is not lacking the data, research infrastructure and human capital, it is a question of connecting, scaling and providing possibilities to replicate already existing solutions in similar contexts. Quoting a report from an event in which KADI participated, ["Knocking on the Door of Higher Education Institutions: AU-EU Innovation Agenda and the Involvement of Nordic Actors" Brussels and online on 27th September 2023][2]

> *"Long-term allocation of resources to build trust and relations are key success criteria for sustainable and equal partnerships. Moreover, improved integration of funding streams for capacity building and research at national, European and international levels are among the crucial conditions for Nordic universities to contribute through their core activities in research, innovation and education."*

By implementing these policies and strategies, African countries can enhance the benefits from existing and new funding mechanisms for climate adaptation solutions, building resilience to climate change, and promote sustainable development across the continent. The success of these efforts requires collaborative action, innovative approaches, comprehensive, timely, continuous and open access data; sustainable and equitable funding allocation mechanisms and; data-supported decision making.

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