

International Symposium on Open Science Clouds (ISOSC) 2023

4-6 September 2023.

Venue: Beijing, China

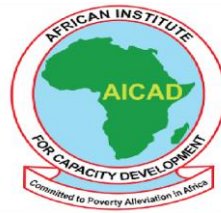
Open Science in Kenya

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Introduction:

Who are the **key champions** of Open Science in Kenya?

- The Africa Open Science Platform aims to position African scientists at the cutting edge of data intensive science. The role of the AOSP East African Node is to support and promote efforts aligned with implementation of open science programmes at a regional level, strengthen knowledge networks and infrastructure access, and enhance cooperation between regions and globally in support of the AOSP's vision.
- AOSP – East African Node is a partnership between the **African Institute for Capacity Development** (<https://www.aicad.or.ke/>), and **Jomo Kenyatta University of Agriculture and Technology** (<https://www.jkuat.ac.ke>), Kenya –the National Member of **CODATA International**.

Kenya Open Data Instruments

Constitution of Kenya, 2010

Article 35, gives citizens the right to access information



Access to Information Act 2016

AN ACT of Parliament that gave effect to Article 35 of the Constitution



JORD Policy

Policy to promote ROI, Collaboration, Innovation, Enable Diverse Studies etc

35. Access to information

- (1) Every citizen has the right of access to—
 - (a) information held by the State; and
 - (b) information held by another person and required for the exercise or protection of any right or fundamental freedom.
- (2) Every person has the right to the correction or deletion of untrue or misleading information that affects the person.
- (3) The State shall publish and publicise any important information affecting the nation.

PART II—RIGHT TO INFORMATION

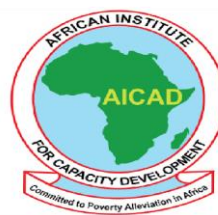
- 4—Right to information.
- 5—Disclosure of information by public entities.
- 6—Limitation of right of access to information.

PART III—ACCESS TO INFORMATION

- 7—Designation of information access officer.
- 8—Application for access.

2.4 Research data and records should be:

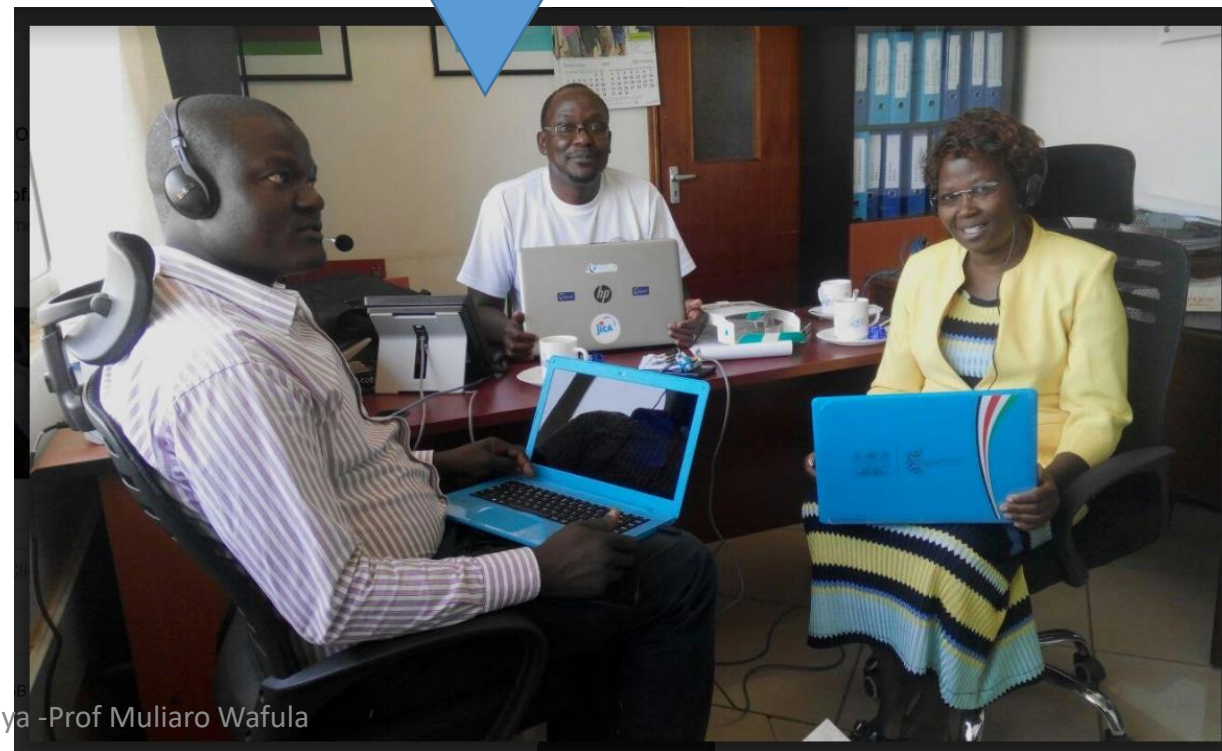
- a) Accurate, complete, authentic and reliable;
- b) Identifiable, retrievable, and accessible;
- c) Secure and safe;
- d) Kept in a manner that is compliant with legal obligations and, where applicable, the requirements of funding bodies and the University Policies and regulations
- e) Able to be made available to others in line with appropriate ethical, data sharing and open access principles.



Creating Innovative Videos for Learning Mathematics for Primary Schools

ODSI: JKUAT

To build open data based innovative mobile
To encourage scientists to open their research data for public consumption and use.
To use open data to offer solutions to societal challenges
To engage partners support on the open research data initiative





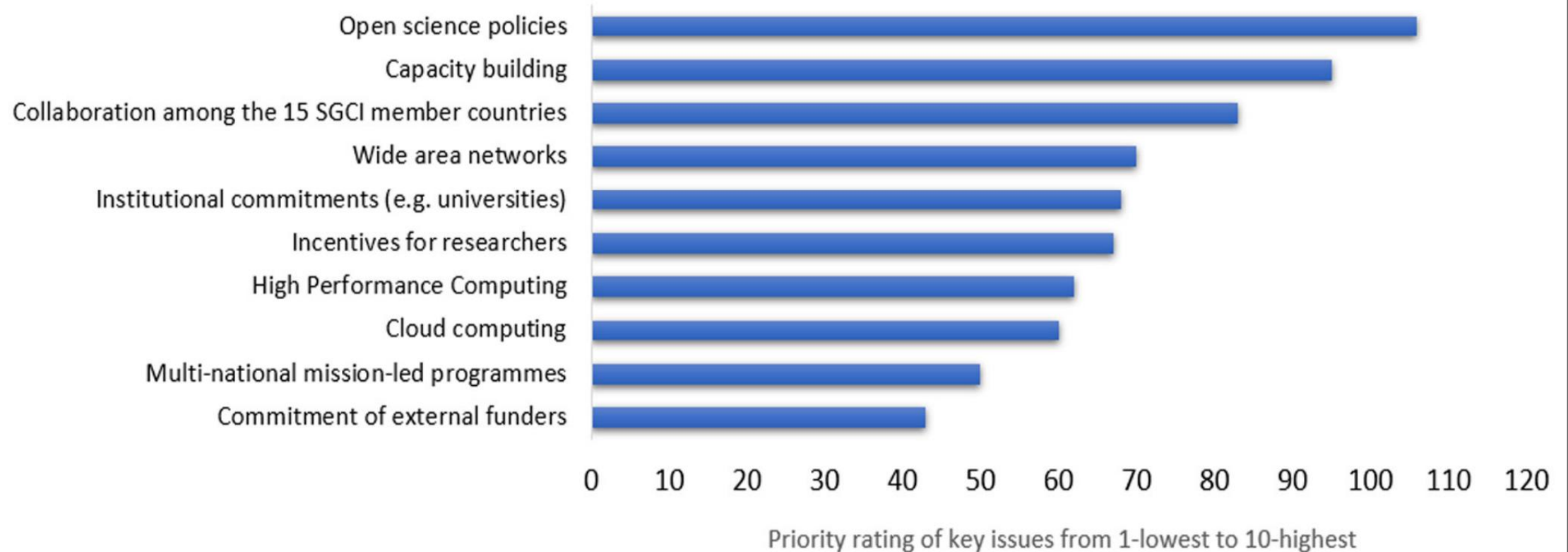
Current Project

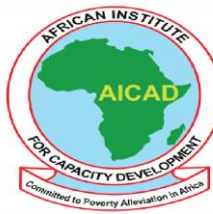
- Development of Data Repository for Decision Making in MoH-National Vaccine and Immunization Program (NVIP)
 - ✓ Publish APIs
 - ✓ Issue DOIs
 - ✓ Create FIP Communities

Organizing VizAfrica 2024: Nairobi Feb 5-7, 2024

Priority ranking of OS issues that contribute to economic and social development in Africa

Cumulative rating of 10 key issues contributing to Collaborative Open Science as per 13 SGCI member countries in Africa namely: Kenya, Burundi, Uganda, Tanzania, Côte d'Ivoire, Botswana, Ghana, Zambia, Mozambique, Sudan, Sierra Leon, Malawi and Namibia





Open Government:

- a culture of governance that promotes the principles of transparency, integrity, accountability and stakeholder participation in support of democracy and inclusive growth.



Kenya Open Government Partnership National Action Plan IV

(https://www.opengovpartnership.org/wp-content/uploads/2021/03/Kenya_Action-Plan_2020-2022.pdf)

SUMMARY OF COMMITMENTS

Commitment number and Title	Commitment Overview	Lead Implementing Organization(s)	Other actors involved-Government	Other Stakeholders
1. Beneficial Ownership	Publish a central public register of beneficial ownership information of companies operating within the Republic of Kenya	Office of the Attorney General-Business Registration Services	PPRA, National Treasury, Financial reporting Center, Ethics and Anti- Corruption Commission	TI-Kenya, HIVOS, NTA, KCSPOG, KEPSA
2. Open Contracting	Implement an interoperable end to end e-government system adopting the Open Contracting Data Standard (OCDS), to cover all stages of public procurement in Kenya.	Public Procurement Regulatory Authority	Senate of Kenya, Council of Governors (CoG), County Assemblies Forum (CAF), Commission on Administrative Justice (CAJ).	Development Gateway, Hivos, Local Development and Research Institute (LDRI), MAPACA Trust, Twaweza East Africa, Youth Agenda, National Taxpayers Association, Transparency International (TI)-Kenya.

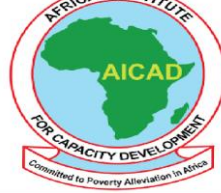
3. Open Data for Development	Lower the barrier and increase access to timely, affordable, up-to-date, and accurate data for socio-economic development, evidence based decision-making and enhanced service delivery.	Kenya Space Agency, ICT Authority, Council of Governors, Office of the Controller of Budget,	Kenya National Bureau of Statistics, Department of Resource Surveys and Remote Sensing (DRSRS), Kenya Meteorological Department (KMD), National Drought Management Authority (NDMA), National Disaster Operations Centre, National Land Commission (NLC)	Local Development Research Institute (LDRI), Global Partnership for Sustainable Development Data (GPSDD), ESRI, Group on Earth Observations (GEO), Digital Earth Africa (DE Africa), Geospatial Society of Kenya (GeoSK), Women in GIS
4. Public Participation and Legislative Openness	Mainstream meaningful public participation in all developmental spheres in the country thereby ensuring that the voice of the public counts and shapes the eventual developmental outcome for ownership.	The Senate of the Republic of Kenya	Office of the Deputy President, Council of Governors (CoG), National Assembly, County Assemblies Forum (CAF)	Mzalendo Trust, Westminster Foundation for Democracy (WFD).

Aspirations of the OGP National Action Plan IV

1. Raise the threshold of ensuring companies' real owners and their information is available for public scrutiny within internationally recognized data standards
2. Government procurement processes remain open, transparent, and accessible to all across Government and in Champion Sub-National Governments
3. **Data for developmental decisions-making and action is timely, available, accessible and maintained in open standards**
4. Deepening democracy by ensuring the process of law and policy within the legislature is open to public engagement and participation



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5. Public servants and duty bearer are held to high-performance standards by citizens
6. Proactive disclosure and access to information by citizens, especially during these challenging time of COVID 19
7. Access to justice remains a high priority, especially for indigents, without delays or denial.
8. The culture of open government is entrenched within public service in Kenya and across the African Continent.

(Ref: Extracted from Forward written by then The Deputy President and currently the President of the Republic of Kenya H.E. Dr William Ruto)

Open Science drivers in Kenya

Other actors involved – Government

Office of the Deputy President, Kenya National Bureau of Statistics (KNBS), Office of Controller of Budget, State Department of Housing and Urban Development, Department of Surveys, Department of Resource Surveys and Remote Sensing (DRSRS), Jomo Kenyatta University of Agriculture and Technology, Kenya Agricultural and Livestock Research Organization (KALRO), Kenya Meteorological Department (KMD), National Drought Management Authority (NDMA), National Disaster Operations Centre, National Environment Management Authority (NEMA), National Land Commission (NLC) and Intergovernmental Relations Technical Committee (IGRTC).

Other actors involved – CSOs, private sector, working groups, multilaterals etc.

Local Development Research Institute (LDRI), Global Partnership for Sustainable Development Data (GPSDD), ESRI, Group on Earth Observations (GEO), Digital Earth Africa (DE Africa), Geospatial Society of Kenya (GeoSK), Women in GIS, Kenya ICT Action Network (KICTANet), Kenya Private Sector Alliance (KEPSA), United Nations Development Programme, Food and Agriculture Organization, CODATA, Data Trace International Ltd and LocateIT Ltd.

	CITIZENS)			
8.	Open Research Data-Open science to accelerate Knowledge creation and Innovation (CODATA)	New	June 2021	May 2022
9.	Development of Data Policies, Data Management Plans for at least five counties	New	June 2021	May 2022

- Open science practices such as open data, open access publications, and collaborations also need to be supported by providing the necessary supporting infrastructure.
- These infrastructures include institutional repositories used to store electronic publications and data (Rosenblum, 2008) and National Research and Education Networks (NRENs), which support collaboration among researchers and sharing of research outputs (Dyer, 2009).
- when early career researchers are trained on open science practices, they utilize and propagate them onwards in their career paths (Schönbrodt, 2019).



Institutions leading practice of OS in Kenya

Table 1: Summary of different approaches to practicing open science by selected Kenyan institutions.

Institution	Open access institutional repositories (IRs)	Open access policies	Training or Events	Infrastructure
University of Nairobi (UoN)	Digital Repository Open Access Resource Center	UoN Open Access Policy 2012 UoN Plagiarism Policy 2013	Open Access week 2015 Open access Week 2016	Open Distance Learning Module Jomo Kenyatta Memorial Library houses KENET .
Jomo Kenyatta University of Agriculture and Technology (JKUAT)	Has an ICT Center of Excellence and Open Data with a sub-task force that advocates for various open science principles.	—	Open Data Workshop 19th Sept 2017 Open Access Workshop Open Access Week on August 18th to 24th 2010	Open and Distance Learning Modules
Kenyatta University	Has Open Access databases with links to open access journals, courseWare, and e-books Institutional repository .	—	Creating awareness about Open Science during Library Open Week in 2016	Open and Distance Learning
Strathmore University	Strathmore University Repository	—	—	—
International Livestock Research Institute (ILRI)	ILRI Repositories	Strategy on Research Publishing Research publishing	Workshops and training on Open science, open access, and open data ILRI Open, Open Data Portal	—



Open Science Infrastructure-KENET

- The ICT infrastructure provided by NRENs is crucial in facilitating open science practices, starting with the open scholarly literature in universities and research institutions through institutional repositories.
- Additionally, NRENs facilitate open educational resources and enable research collaborations between local and international researchers (Foley, 2016). In Kenya, the Kenya Education Network (KENET) (<https://www.kenet.or.ke/>) is the NREN supporting research and education institutions
- 71 public and private universities and 21 research institutions in Kenya have memberships in KENET
- KENET provides internet connectivity to these institutions, facilitating research, sharing, teaching, and collaboration with other institutions.
- NRENs such as KENET can also promote open science in academic and research institutions by providing infrastructure for open science seminars, workshops, hackathons, and any other activities concerning open science, such as open sharing of data and collaboration among researchers.



Open Educational Resources

- OERs in Kenya and found that most universities are yet to offer educational resources, including teaching, learning, and research materials, openly and for free.
- One must be enrolled as a student to access the open learning platforms, which is a barrier for non-students.
- AOSP will provide such resources and is looking for partners



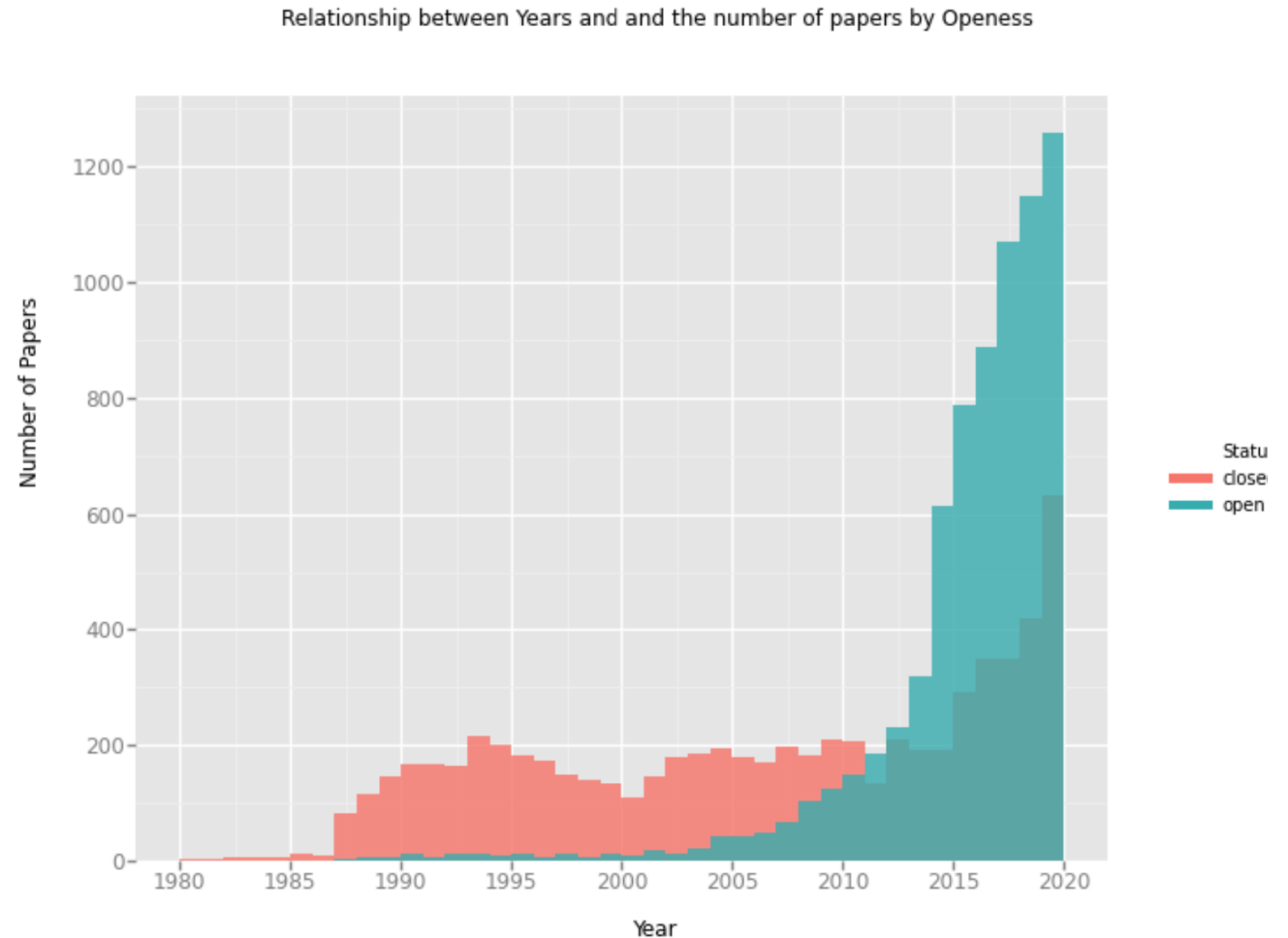
Institutional repositories

- a recent study on digital research repositories in Africa showed that Kenya had 32% of repositories in Africa and was preceded by South Africa, 40% (Bezuidenhout et al., 2020).
- Kenya has several public and private universities and local and international research institutions that have embraced open research at different degrees and in different ways. We found that research institutions such as the International Centre of Insect Physiology and Ecology (icipe) and Kenya Agricultural and Livestock Research Organization (KALRO) have repositories where their research publications can be accessed (Table 1).
- Jomo Kenyatta University of Agriculture and Technology,, the University of Nairobi (UoN), Kenyatta University, and Africa Nazarene University have institutional repositories and open access resources within their digital Libraries (Table 1).
- In addition to literature repositories, ILRI has an open access data portal where research data can be accessed. AOSP EA node would like to provide such a portal in support for growth of open access data repositories in African



Adoption of open access publishing by Kenya authors

- the publishing trend in Kenya shows that scholars increasingly opt to publish in open access journals
- The shift towards open access publishing is particularly welcome in Africa



Priority issues for open science policy

- **Adopt the FAIR (Findable, Accessible, Interoperable, Re-usable) data principles.**
- **Apply instrumental, procedural and distributive data justice.**
- Create an enabling environment in support of Open Access for all research outputs.
- Support the use (application and implementation) of open licenses for both research data and literature.
- Provide a shared and interoperable research infrastructure.
- Incentivize data sharing and Open Access publishing

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- Encourage the use of Open Source software.
- Extend the principle of Open Innovation.
- Integrate data science and data management into institutional curricula.
- Include citizens as stakeholders through community engagement, science communication efforts.
- Determine where the limits of openness lie (e.g. privacy, safety and security).

Summary of African Open Science Policy Framework

(Ref: Wafula et al, 2019)



Policy Statements		Enabling Practices	Policy Implementers										
			1	2	3	4	5	6	7	8	9	10	11
1	Adopt Findable, Accessible, Interoperable and Reusable (FAIR) Data Principle	- Promote open science culture through training and awareness raising - Develop cloud computing facilities that provide networked computation, data access and analysis tools - Promote science diplomacy											
2	Observe instrumental, procedural and distributive data justice while handling, using and distributing data	- Promote open science culture through training and awareness raising - Encourage citizen science - Support open collaboration through ICTs - Develop cloud computing facilities - Support Open Innovation - Promote Science Diplomacy											
3	Establish open access to publications through repositories and journals	- Promote Open Science Culture through Training and Awareness raising - Encourage Citizen Science - Support Open Collaboration through ICTs - Promote Science Diplomacy											
4	Support Submission of data to a repository before submitting the respective manuscript describing the respective data	- Promote Open Science Culture through Training and Awareness raising - Encourage Citizen Science - Support Open Collaboration through ICTs											
5	Develop Shared and interoperable data infrastructure	- Develop cloud computing facilities that provide networked computation, data access and analysis tools - Support open collaboration through ICTs - Support open innovation - Encourage citizen science											

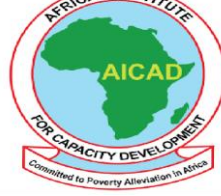
Policy Implementer Key:

1 -Government, **2** -Policy Makers, **3** -Universities, **4** -Scholarly Societies, **5** - Publishers, **6** - Research Institutes, **7** - Research Funding Agencies, **8** -Repositories, **9** - Libraries, **10** -Archives, **11**- Researchers

Policy Statements		Enabling Practices	Policy Implementers										
6	Encourage use of recognized waiver or license that is appropriate for data	- Promote open science culture through training and awareness raising - Promote open software code											
7	Public and private funders should adopt obligatory green, gold or a hybrid of green and gold open access policies with their respective implementation measures	- Promote open science culture through training and awareness raising - Support open collaboration through ICTs - Develop cloud computing facilities that provide networked computation, data access and analysis tools - Support open innovation - Promote science diplomacy											
8	Offer incentives to acknowledge open practices in publications	- Promote open science culture through training and awareness raising - Promote open software code - Develop cloud computing facilities - Support open collaboration											
9	Encourage Open peer-review models	- Promote open science culture through training and awareness raising - Support open collaboration through ICTs - Develop cloud computing - Support open innovation. - Promote science diplomacy											

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THANK YOU