

Inputs (from Africa) to UNESCO Molapo Qhobela, PhD Chief Executive National Research Foundation - South Africa







Question 1

How can Open Science democratise the scientific process in the African context and assist in reducing the existing gaps in science technology and innovation (STI)?





Why Open Science

Greater access to scientific inputs Open access to scientific outputs Efficiency Quality & integrity and outputs can increase allow for greater evaluation and scientific productivity through scrutiny by the scientific reducing duplication, allowing community which means more more research from the same accurate replication and validation data and multiplying of research results. Openness to opportunities for domestic and data contributes to maintain science's self-correction principle. global participation in the â research process. \nnovation Economic benefits Open science can reduce delays in Science plays a key role in WHY OPEN the re-use of scientific research today's knowledge economies R including articles and data, and and increased access to research **SCIENCE** promote a swifter path from results, including data, can research to innovation to produce positive impact not only scientific new products and services. ? systems but also innovation. Science, often publicly funded, Public & disclosure engagement should be publicly accessible to Global benefits Open science promotes promote a greater awareness collaborative efforts and faster among citizens and to build public knowledge transfer for a better trust and support for public understanding of global policies and investments in challenges and wicked problems. research. Open science also promotes citizen science in experiments and data collection.

University of Cape Town





Open Science and Research

In order to unleash Africa's full knowledge potential, it would be appropriate to consider adopting the philosophy of Open Science and adapt the national intellectual capacities, capabilities and infrastructures to this new reality.





Question 2

Which components of Open Science are the most relevant in this regard?

Open Data and Open Access

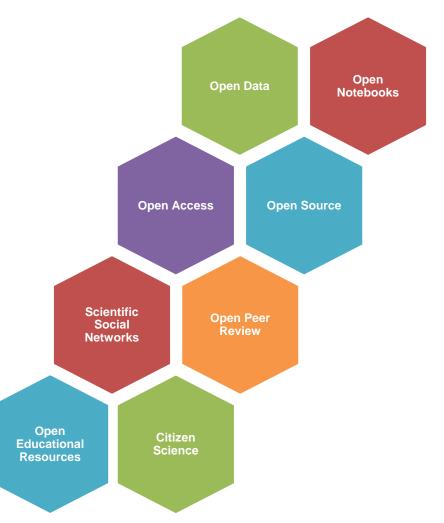




Components of Open Science

Open Science:

- Vital enabler in maintaining the rigor and reliability of research;
- Supports the creative integration of diverse data resources to address complex modern challenges;
- Involves various movements aiming to remove the barriers for sharing any kind of output, resources, methods or tools, at any stage of the research process.



National

Research



Citizen Science and Open Data

- Citizen science occurs when real people get involved in the research and scientific process.
- Specific qualifications are not necessary to make a contribution;
- The benefits to society are measure through the developing discourse on social media and at dinner tables – people are starting to speak science!



Galaxy Zoo is a crowdsourced astronomy project where global citizens help in the morphological classification of large numbers of galaxies.

50 Million classifications were received by Galaxy Zoo an more than 150 000 people contributed.



Thousands of people around the world contribute bird observations to the **Cornell Lab of Ornithology** which gathers to reveal how birds are affected by habitat loss, pollution, disease, climate, and other environmental changes.

More than 60 scientific papers have been written using Cornell Lab since 1997.



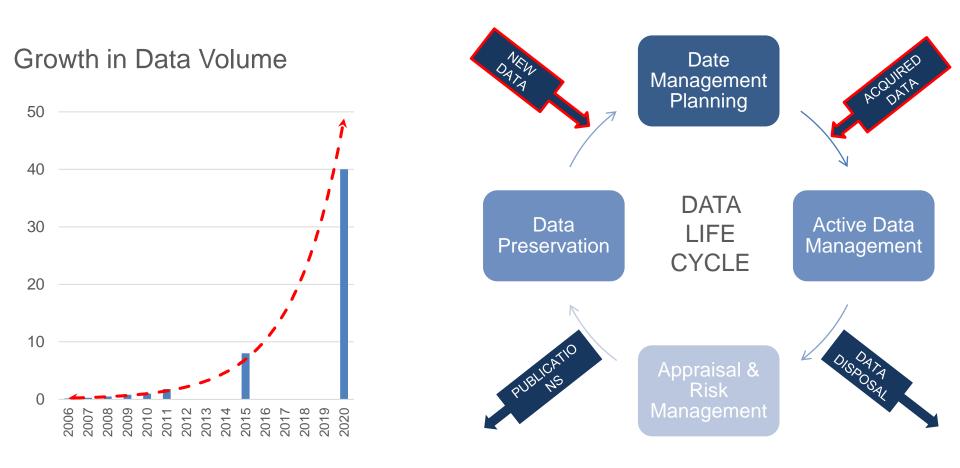
Foldit is an online puzzle video game about protein folding. It is part of an experimental research project where the objective is to fold the structures of selected proteins as perfectly as possible, using tools provided in the game.

Fold-it players discovered the structure of protein cutting enzymes produced by an AIDS like virus in monkeys - in 3 weeks!





Open Data







QUESTION 3

What are the key challenges?

Improve our capacity and capability to leverage on the power of Open Data and Open Access





Status of Research on the African Continent

- Africa accommodates 16.64% of the worlds population (1 314 187 677);
- 41% of the African population is urbanised;
- Median age 19.4 years
- Researchers/ million of population
 is a global metric of maturity:
 - Europe: 3500 researcher/ mil of population;
 - China: 1100 researcher/ mil of population;
 - Africa: <100 researcher/ mil of population.</p>







Open Access – A Global Movement

- Embrace Open Access as part of our agenda for Open Science Open Access is a commitment to the democratisation of knowledge through equity of access:
- Research system has to move towards new approaches;
- Need an alignment of vision and purpose to harness the benefits of the OA2020 movement;
- Collective negotiation of a transformative agreement which seeks to:
 - Move the systems out of a "pay to read" framework to a "pay to publish" framework;
 - On the basis that <u>copyright will reside with individual</u> authors; and
 - Cost Neutrality



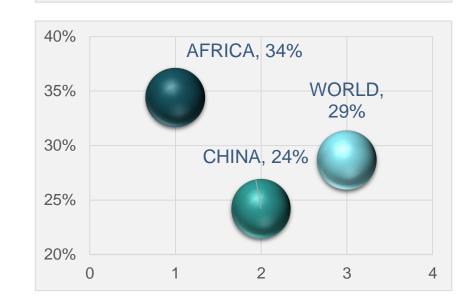


Challenges: Open Access Publications 2009 – 2018

Africa: Percentage Open Access Publications 2009 – 2018 (countries with >5000 records)

63% 59% 54% 52% _{50%} 45% 44% 42% 43% 38% 36% 35% 29% 26% 19% 18% NIGERIA UGANDA MALAWI KENYA GHANA SUDAN EGYPT TUNISIA SOUTH AFRICA ALGERIA ETHIOPIA TANZANIA CAMEROON MOROCCO SENEGAL ZIMBABWE

Percentage Open Access Publications 2009 - 2018







Advancing knowledge. Transforming lives. Inspiring a nation.



Challenges: Open Access

Currently the bulk of scholarly articles are published through a paywall system - In the Open Science era:

- Alternate publishing models will need to be adapted, adopted and or created;
- Incentives for publishing in open access journals;
- Research data standards will have to be adopted;
- Data protection issues.

Scientific contributions will require alternate metrics:

Develop new protocols to support open peer review;
 New ways of managing research performance; and
 New ways of funding research.





Question 4

Who are the main stakeholders? – Strategic Partners?





 $\label{eq:constraint} Advancing knowledge. \ Transforming \ lives. \ Inspiring \ a \ nation.$

The African Open Science Platform



- Embraces the vision of the African Union Agenda 2063: 'The Africa we want'
- Is Pan-African in scope
- Recognises that size, diversity and interconnectivity of a science community are key to a dynamic, robust and creative discourse

"The creation of an African platform for research and innovation will enable the dissemination of goal relevant African research and innovation to governments and citizens" United Nations Economic Commission For Africa, Dakar 2018









The African Open Science Platform

- The platform is the connective tissue between dispersed actors in pursuit of shared and overlapping open science goals and has the potential to provide:
- Cloud computing facilities that provide networked computation, data access and analysis tools for African Science.
- Software tools, experience-based advice on research data management and on open science policies and practice.







Question 5

Which key aspects of the transition to Open Science should be considered by the UNESCO Recommendation?





The Transition to Open Scinece

Recommendations to UNESCO:

- Partner with the AOSP in pursuing tangible outcomes towards establishing the platform as a Pan African initiative;
- Expand the African landscape assessment (ASSAf: 2018) in order to confirm and / or expand on the aspects of:
 - > Political willingness to invest in research and research infrastructure;
 - Enabling policy initiatives including incentives and skills development for the digital revolution.
- Co-ordinate in partnership with AOSP a coalition of participants amongst the research community on the Continent to address the change management issues related to:
 - > Open access
 - Open notebooks
 - > Open peer review etc.





Changing perspectives of Africa



March 2nd 2013

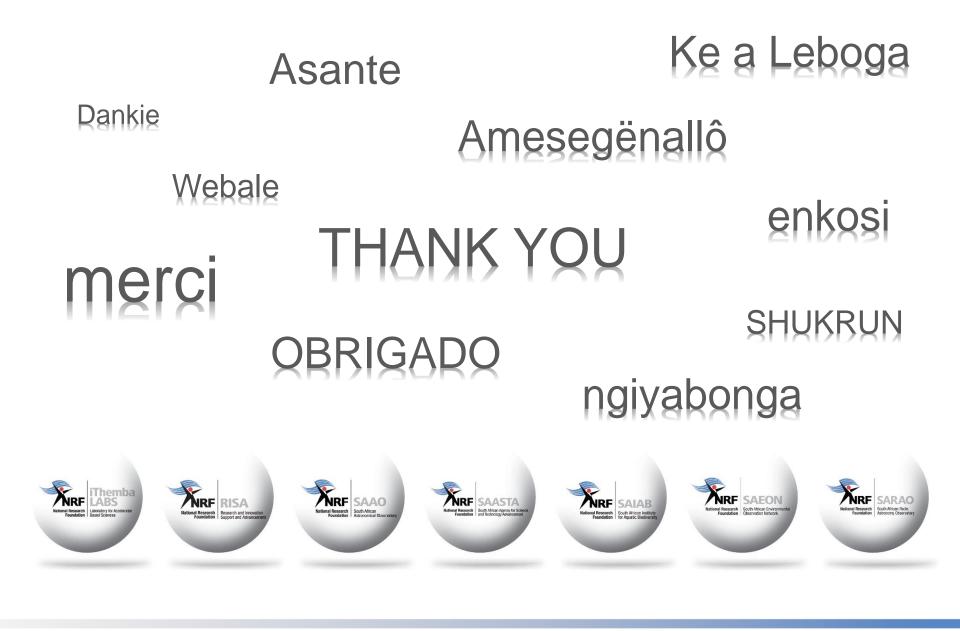
Let's write our own narrative for 2030







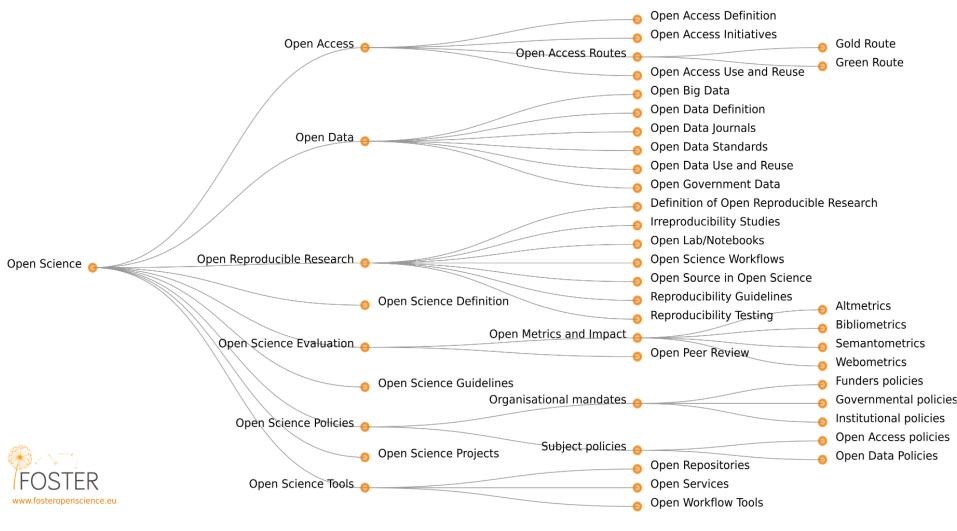
March 9th 2019







Foster's Open Science Taxonomy



Pontika et al. (2015).





Status of Research on the African Continent

Africa: Normalised Citation Impact 2009-2018

