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UNESCO Recommendation on Open Science



Science for Sustainable Development

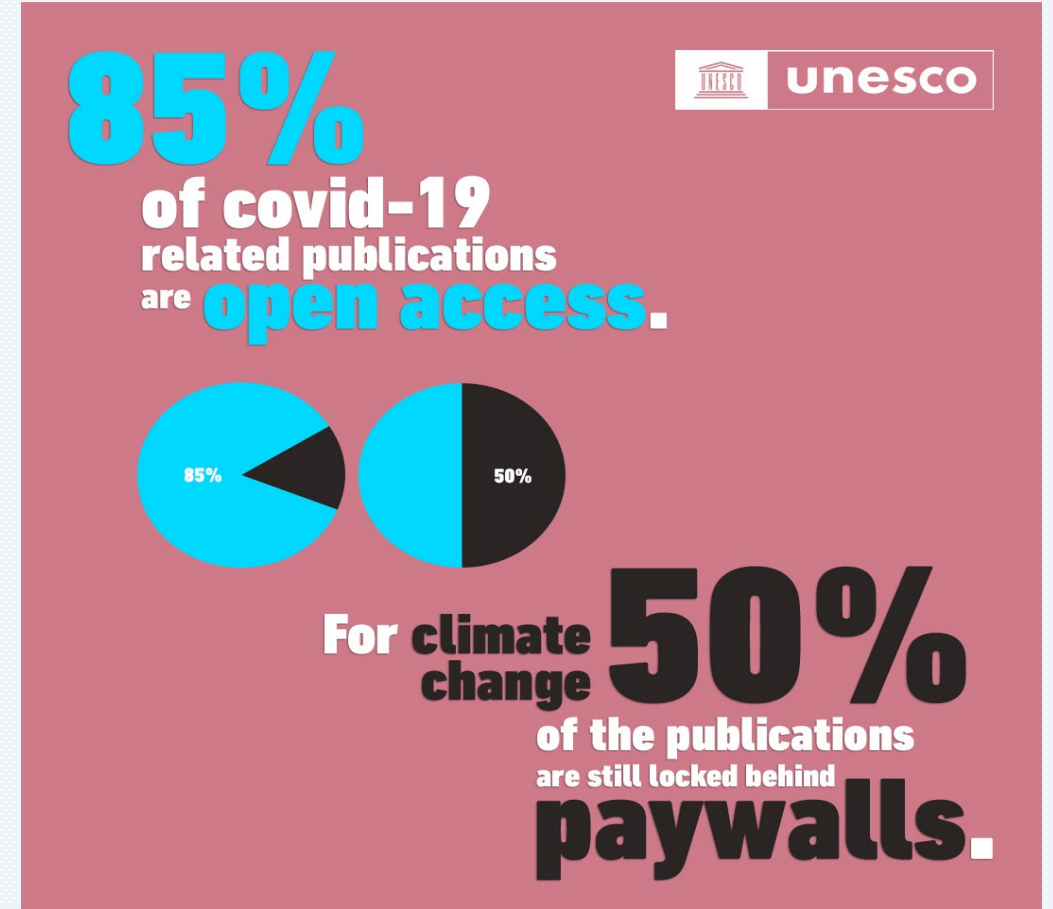
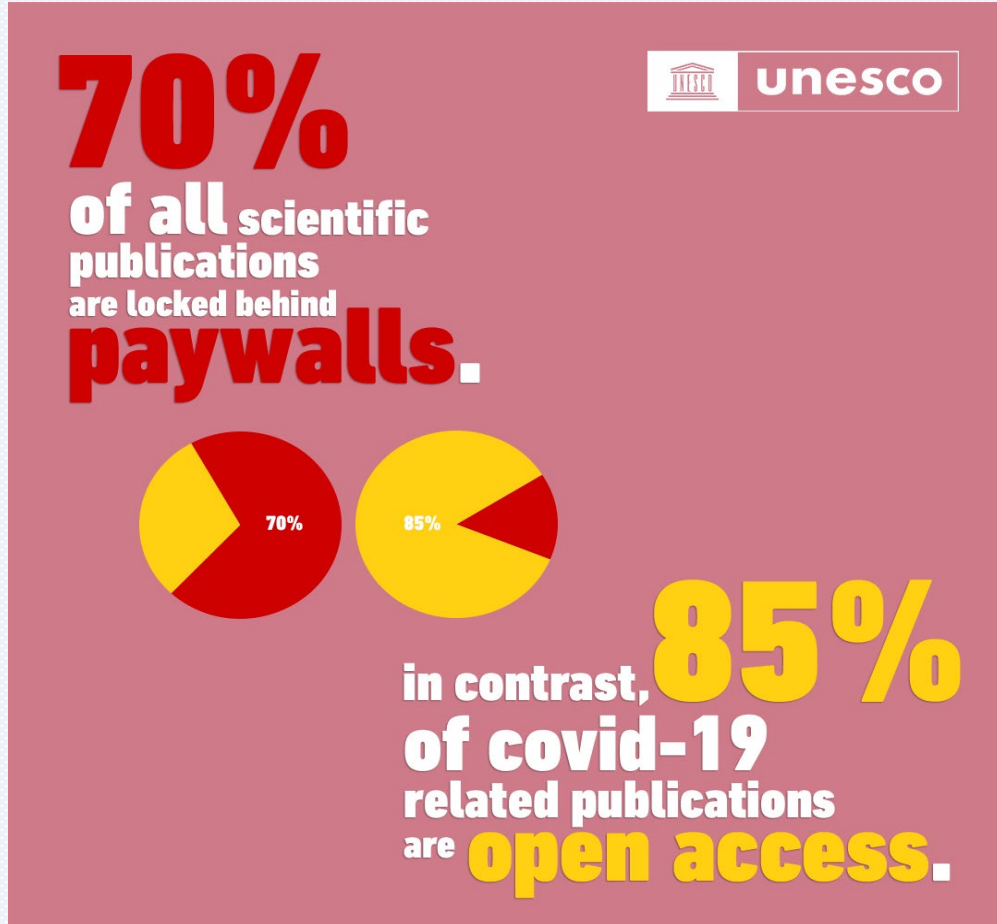


The achievement of sustainable development relays on STI and innovative solutions that require an **efficient, transparent and vibrant scientific community** not only stemming from scientists, but from the **whole of society**.

Need to **democratize science** and the entire scientific process and make it more **efficient, equitable, transparent and inclusive**.

Need for Open Science

Unequal Access to Knowledge



Need for an **international policy and action framework**

Need for a common definition of open science, shared set of values and principles

Source: Dimensions

Towards the UNESCO Recommendation on Open Science

2019-2021: UNESCO led a two-year **inclusive, transparent and consultative process**:

- ✓ A global online consultation (online survey) on open science
- ✓ Regional multistakeholder consultations for the 6 UNESCO electoral groups
- ✓ Thematic consultations and inputs from partners and stakeholder groups
- ✓ The draft text of the Recommendation was negotiated by the intergovernmental special committee meeting of experts, May 2021.



UNESCO Recommendation on Open Science

In 2021, at the UNESCO 41st General Conference, 193 Member States adopted the first international standard-setting instrument on Open Science in the form of a UNESCO Recommendation on Open Science.



UNESCO Recommendations

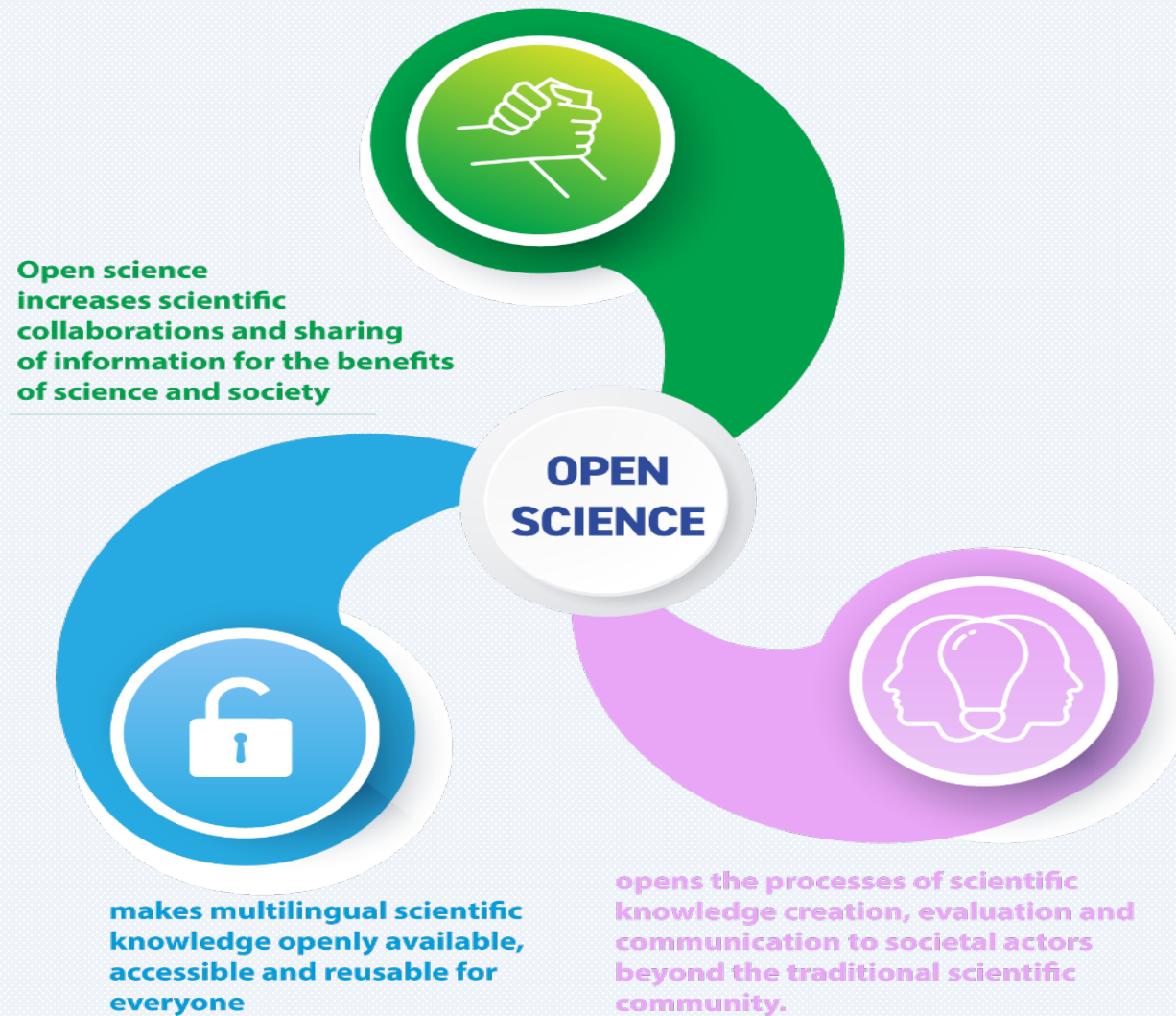
Legal instruments in which “the General Conference formulates principles and norms for the international regulation of any particular question and invites Member States to take whatever legislative or other steps may be required in conformity with the constitutional practice of each State and the nature of the question under consideration to apply the principles and norms aforesaid within their respective territories”.

Highlights of the Recommendation

- ❖ It is the first **international normative instrument** on Open Science;
- ❖ it contains the first **internationally agreed definition** of Open Science;
- ❖ it spells out the consensus **core values and guiding principles** of Open Science;
- ❖ it addresses **multiple actors and stakeholders** of Open Science;
- ❖ It recommends **actions on different levels** to operationalize the principles of Open Science;
- ❖ it proposes **innovative approaches for Open Science at different stages** of the scientific cycle;
- ❖ it calls for development of a **comprehensive Open Science monitoring framework**.



A Common Definition of Open Science



Key Pillars of Open Science



Key Objectives – Key Areas of Action



Member States are encouraged to prioritise seven areas in their implementation of the *Recommendation*:

1. Promoting a common understanding of OS and its associated benefits and challenges, as well as the diverse paths to OS
2. Developing an enabling policy environment for OS
3. Investing in infrastructure and services which contribute to OS
4. Investing in training, education, digital literacy and capacity-building, to enable researchers and other stakeholders to participate in OS
5. Fostering a culture of OS and aligning incentives for OS
6. Promoting innovative approaches to OS at different stages of the scientific process
7. Promoting international and multistakeholder co-operation in the context of OS with a view to reducing digital, technological and knowledge gaps.

Why Open Science?



#OpenScience

increases

- quality and integrity
- collective benefit
- equity and fairness
- diversity and inclusiveness of research.



#OpenScience

is
transparent
high-quality
diverse
inclusive
multilingual
equitable



Values and Principles

VALUES

Quality and integrity

Collective benefit

Equity and fairness

Diversity and
inclusiveness

OPEN
SCIENCE

PRINCIPLES

Transparency, scrutiny,
critique and reproducibility

Equality of opportunities

Responsibility, respect
and accountability

Collaboration,
participation and inclusion

Flexibility

Sustainability

As open as possible and as closed as necessary



OPEN DOES NOT MEAN UNREGULATED

OPEN DOES NOT MEAN WITHOUT ANY COSTS

As open as possible and as closed as necessary

AS OPEN AS POSSIBLE

Access to scientific knowledge should be as open as possible, but sometimes access may need to be restricted, for example to protect human rights, confidentiality, intellectual property rights, personal information, threatened or endangered species, and sacred and secret indigenous knowledge. Open science encourages scientists to develop tools and methods for managing data so that as much data as possible can be shared, as appropriate.

Key challenges and high impact areas for the implementation of the UNESCO OSR



Change in the
conventional
scientific culture



Human and
institutional
capacity



Adequate
infrastructures,
including reliable
internet connectivity



Alignment of
incentives and
revision of criteria for
evaluation of
scientific excellence
and scientific careers



Addressing the
unintended negative
consequences of
open science
practices

CAPACITY BUILDING POLICIES FINANCING/INCENTIVES INFRASTRUCTURES MONITORING

Open Science in Africa

Development of National Open Science Policies and Roadmaps

- ❖ Nigeria, South Africa, Ivory Coast, Ghana, Botswana, Uganda, Mozambique....

Development of institutional policies

- ❖ Ethiopia, Mozambique, Kenya, Tanzania....

Capacity Building

- ❖ The Public Library of OS (**PLOS**)- the Training Centre in Communication (**TCC**) - **UNESCO** sub-regional workshops...

Platforms and Infrastructures

- ❖ African Open Science Platform, AfricArXiv...

Different Actors

- ❖ AAU, AAS, TCC, **LIBSENSE**, NRENs, **UbuntuNet Alliance**, Africa Open Science Hardware....
- ❖ AU, Regional and subregional bodies...

Specific Recommendations for Universities

- ❖ Encouraging research-performing institutions, universities, scientific unions and associations, and learned societies **to adopt statements of principle in line with this Recommendation to encourage OS practice** in coordination with national science academies, associations of early-career researchers such as young academies and the International Science Council (ISC).
- ❖ Combining efforts of many different stakeholders, including research funders, **universities, research institutions**, publishers and editors, and scientific societies across disciplines and countries, **to change the current research culture and to recognize researchers for sharing**, collaborating and engaging with other researchers and society, and to support, in particular, early-career researchers in particular to drive this cultural change.



Implementation of the UNESCO Recommendation on Open Science



December 2022, World Science Forum, Cape Town, South Africa

- ✓ Open Science Day at the World Science Forum on 7 December 2022
- ✓ Training for universities and launch of the Open Science Checklist for Universities



Join the Global Open Science Movement



Contact: openscience@unesco.org

Join the UNESCO Open Science Partnership!

Contribute to global open science calls !

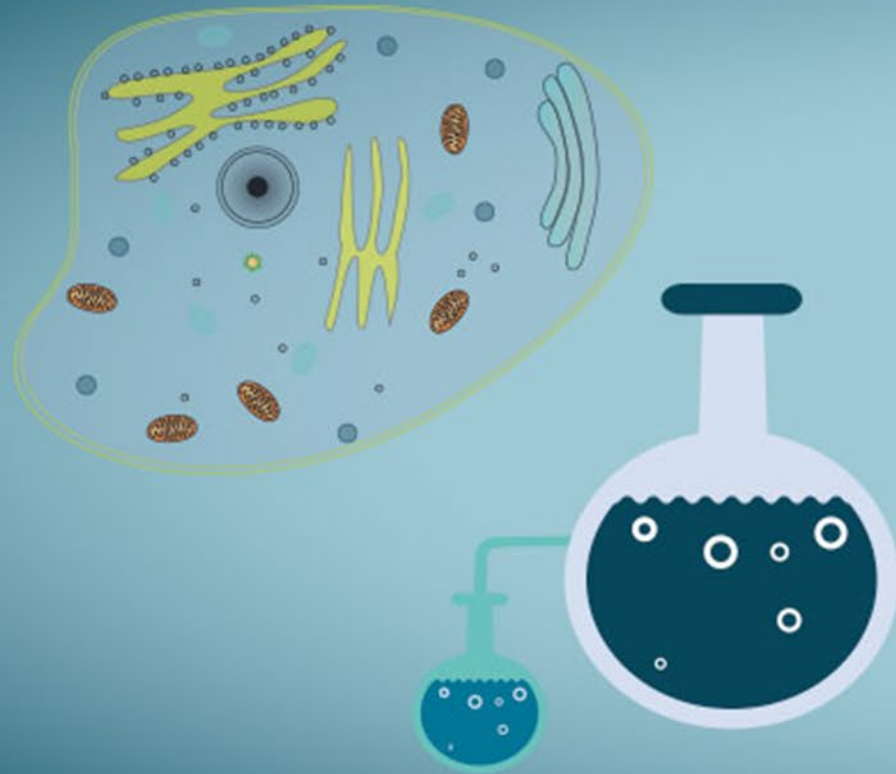
Engage in the global discussions!

UNESCO Open science website:

<https://on.unesco.org/openscience>



Thank you

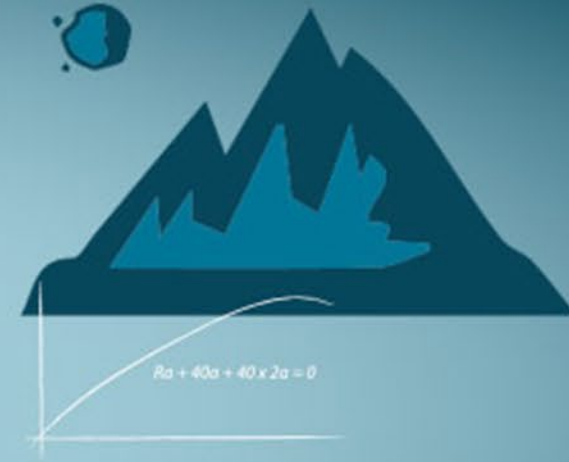


$$2a+b=x^{2x}$$

$$\pi=3.141592654$$

$$x=ut \cos(\alpha)$$

$$y=ut \sin(\alpha); \frac{1}{2}gt^2$$



$$\frac{(1-e^2)}{(1+e)^2}$$

$$v_b' = \frac{1}{4}u(1-e^2)$$
$$v_c' = \frac{1}{4}u(1+e)^2$$
$$=3.141592654$$

$$v_a + v_b = u$$
$$v_a = \frac{1}{2}u(1-e)$$
$$v_b = \frac{1}{2}u(1+e)$$
$$v_b' + v_c' = v_b = \frac{1}{2}u(1+e)$$
$$v_b' - v_c' = -ev_b = -\frac{1}{2}eu(1+e)$$
$$v_b' = \frac{1}{4}u(1-e^2)$$
$$v_c' = \frac{1}{4}u(1+e)^2$$



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