CHECKLIST FOR OPEN ACCESS PUBLISHERS ON IMPLEMENTING THE UNESCO RECOMMENDATION ON OPEN SCIENCE

This document is part of the UNESCO Open Science Toolkit, designed to support implementation of the UNESCO Recommendation on Open Science. It has been produced in partnership with the Open Access Scholarly Publishing Association (OASPA), a diverse community of organizations engaged in open scholarship. The aim is to provide practical assistance to the open access publishing community to better understand the Recommendation by highlighting the areas that apply to open access publishers who wish to support its implementation.

Within the subset of open scientific knowledge, this document refers to scientific publications that include, *inter alia*, journal articles and books, research reports and conference papers. These publications may be, contain or be accompanied by original scientific research results, research data, software, source code, source materials, workflows and protocols, digital representations of pictorial and graphical materials and scholarly multimedia material.

According to the UNESCO Recommendation on Open Science, access to scientific knowledge should be as open as possible, and may need to be restricted, in specific circumstance, for example to protect human rights, confidentiality, intellectual property rights, personal information, threatened or endangered species and sacred and secret indigenous knowledge, among others. These circumstances are to be considered exceptions to the practices hereby outlined.

As an open access publisher, how are you…

Disseminating scientific publications

Publishers may disseminate scientific publications and/or their accompanying materials in two ways:

- by publishing them on open access online publishing platforms; and/or
- by depositing them and making them immediately accessible upon publication in open online repositories that are supported and maintained by:
  - » an academic institution,
  - » a scholarly society,
  - » a government agency or
  - » another well established not-for-profit organization devoted to the common good that enables open access, unrestricted distribution, interoperability and long-term digital preservation and archiving.

Providing clear access rights

A paywalled method of publication, where immediate access to scientific publications is only granted in exchange for payment, is not aligned with the UNESCO Recommendation on Open Science.

The Recommendation covers open access to scientific publications, research data, metadata, open educational resources, software and source code and hardware that are available in the public domain or under copyright and licensed under an open license.

Such license must allow access, re-use, repurpose, adaptation and distribution under specific conditions to all actors immediately or as quickly as possible[1] and free of charge.

Any transfer or licensing of copyrights to third parties should not restrict the public's right to immediate open access to a scientific publication.

[1] Regardless of location, nationality, race, age, gender, income, socio-economic circumstances, career stage, discipline, language, religion, disability, ethnicity or migratory status or any other grounds

Thinking beyond scientific articles

Scientific outputs related to publications[2] that are openly licensed or dedicated to the public domain should be deposited in a suitable open repository, following appropriate technical standards that allow them to be properly linked to in publications.

Supporting inclusive engagement and dialogue

Open science includes all scientific disciplines and aspects of scholarly practices and builds on four key pillars: open access to scientific knowledge, open science infrastructures, open engagement of societal actors and open dialogue with other knowledge systems.

There are multiple actors and stakeholders in research and innovation systems and each of them plays a role in the operationalization of open science. Similarly, scientific publishing serves many audiences in addition to academics and scientific researchers.

In practice, inclusive engagement ranges from addressing practical aspects of accessibility through to meaningful engagement with marginalized and underrepresented groups. Engagement and dialogue can inform the creation, use, publication and dissemination of published scientific outputs in multiple formats.

OPEN DIALOGUE WITH OTHER KNOWLEDGE SYSTEMS

Open dialogue with other knowledge systems is the dialogue between different knowledge holders. It is in line with the 2001 UNESCO Universal Declaration on Cultural Diversity and recognizes the richness of diverse knowledge systems and theories and the diversity of knowledge producers.

Open dialogue aims to promote:

- the inclusion of knowledge from traditionally marginalized scholars;
- inter-relationships and complementarities between diverse knowledge systems;
- adherence to international human rights norms and standards;
- respect for knowledge sovereignty and governance;
- the recognition of the rights of knowledge holders to receive a fair and equitable share of benefits that may arise from the utilization of their knowledge.

OPEN ENGAGEMENT WITH SOCIETAL ACTORS

Open engagement is the extended collaboration between scientists and societal actors beyond the scientific community. Open science provides the basis for citizen and community involvement in the generation of knowledge and for enhanced dialogue between scientists, policymakers and practitioners, entrepreneurs and community members, giving all stakeholders a voice in developing research that is compatible with their concerns, needs and aspirations. This is achieved by:

- opening up practices and tools that are part of the research cycle and by making the scientific process more inclusive and accessible to the broader inquiring society;
- implementing new forms of collaboration and work such as crowdfunding, crowdsourcing and scientific volunteering.

[2] Such as original scientific research results, research data, software, source code, source materials, workflows and protocols, digital representations of pictorial and graphical materials and scholarly multimedia material

Are your publishing values aligned with the core values of the UNESCO Recommendation on Open Science?

The core values of open science stem from:

- the rights-based, ethical, epistemological, economic, legal, political, social, multi-stakeholder and technological implications of opening science to society;
- the broadening of the principles of openness to the whole cycle of scientific research.

The four core values are: quality and integrity; collective benefit; equity and fairness; and diversity and inclusiveness.

1 Quality and integrity

Open science should respect the fundamental freedom of scientific inquiry and human rights. It should support high-quality research by:

- bringing together multiple sources of knowledge;
- making research methods and outputs widely available for rigorous review and scrutiny;
- facilitating a transparent evaluation processes.

2 Collective benefit

As a global public good, open science should belong to humanity in common and benefit society. To this end:

- scientific knowledge should be openly available and its benefits universally shared;
- the practice of science should be inclusive, sustainable and equitable, as should opportunities for scientific education and capacity development.

3 Equity and fairness

Open science should play a significant role in ensuring equity among researchers from developed and developing countries.

Open science should enable fair and reciprocal sharing of scientific inputs and outputs and equal access to scientific knowledge for both producers and consumers of knowledge.[3]

4 Diversity and inclusiveness

Open science should embrace a diversity of knowledge, practices, workflows, languages, research outputs and research topics that support the needs of the scientific community as a whole.

Open science should embrace:

- diverse research communities and scholars;
- the wider public;
- knowledge holders beyond the traditional scientific community, including as appropriate:
  - » indigenous peoples and local communities;
  - » societal actors from different countries and regions.

[3] Regardless of location, nationality, race, age, gender identity, income, socio-economic circumstances, career stage, discipline, language, religion, disability, ethnicity or migratory status, or any other grounds

Have you adopted the guiding principles aligned with the core values?

The guiding principles for open science provide a framework to help the values be upheld and ensure that the ideals of open science are made a reality.

The six guiding principles are: transparency, scrutiny, critique and reproducibility; equality of opportunities; responsibility, respect and accountability; collaboration, participation and inclusion; flexibility due to diversity, and sustainability.

1 Transparency, scrutiny, critique and reproducibility

Increased openness should be promoted in all stages of scientific endeavor, with the view to:

- reinforcing the strength and rigour of scientific results;
- enhancing the societal impact of science;
- increasing the capacity of society as a whole to solve complex interconnected problems.

Increased openness leads to increased transparency of scientific information. It reinforces the fundamental feature of science as a distinct form of knowledge based on logic and the scrutiny of scientific peers.

2 Equality of opportunities

All scientists and other open science actors and stakeholders have an equal opportunity to access, contribute to and benefit from open science.

3 Responsibility, respect and accountability

With greater openness comes greater responsibility for all open science actors and this should be the basis for the good governance of open science.

The basis for good governance is also formed through:

- respect for ethical principles and implications pertaining to research;
- public accountability;
- sensitivity to conflicts of interest;
- vigilance as to possible social and ecological consequences of research activities;
- intellectual integrity.

4 Collaboration, participation and inclusion

Beyond the boundaries of geography, language, generations and resources, collaborations at all levels of the scientific process should become the norm.

To solve problems of social importance, collaboration between disciplines should be promoted together with the full and effective participation of societal actors and the inclusion of knowledge from marginalized communities.

5 Flexibility due to diversity

There is no one-size-fits-all way of practicing open science. This is because of the diversity of knowledge systems, actors and capacities across the world, as well as the evolving nature of supporting information and communication technologies.

Different pathways for the transition to open science and for the practice of open science need to be encouraged. The pathways should uphold the core values above and maximize adherence to the guiding principles.

6 Sustainability

To be as efficient and impactful as possible, open science should build on long-term practices, services, infrastructures and funding models that ensure the equal participation of scientific producers from less privileged institutions and countries.

Open science infrastructures should be organized and financed upon an essentially not-for-profit and long-term vision. As far as possible, the vision should enhance open science practices and guarantee permanent and unrestricted access to all.

Do you incorporate the following areas of action into your publishing activities?

Promoting a common understanding of open science, its associated benefits and challenges, as well as diverse paths to open science by:

☑ **Encouraging bibliodiversity** through:

- the diversity of formats and means of publications, including those produced by the humanities and social sciences;
- the diversity of business models, including not-for-profit, academic and scientific community-driven publishing models as a common good;
- encouraging a broad range of topics, outputs and languages.

☑ **Encouraging multilingualism** in the practice of science, in scientific publications and in academic communications. For example, see the recommendations of the Helsinki Initiative on Multilingualism in Scholarly Communication.

Investing in open science infrastructures and services by:

☑ **Helping develop contextualized community agreements.** International scientific unions and associations, regional or national research infrastructures and journal editorial boards each have a role to play in helping develop community agreements, concluded in the context of regional or global research communities.

Those agreements should define community practices for data sharing, data formats, metadata standards, ontologies and terminologies, tools and infrastructure.

Investing in human resources, training, education, digital literacy and capacity building for open science by:

☑ **Supporting science communication** of open science practices, with a view to the dissemination of scientific knowledge to:

- scholars in other research fields;
- decision-makers;
- the public.

To build public trust in science, while increasing the engagement of societal actors beyond the scientific community, the following activities can be considered:

- the dissemination of scientific information through scientific journalism and media;
- the popularization of science;
- open lectures;
- social media communications.

In science communication of open science, to avoid misinterpretation and dissemination of misinformation, the quality and appropriate citation of original sources of information are of paramount importance.

Fostering a culture of open science and aligning incentives for open science by:

☑ **Adopting policies**, in line with the UNESCO Recommendation on Open Science, that:

- support and reward open access to scientific knowledge, including:
  - » scientific publications;
  - » open research data;
  - » open software;
  - » source code;
  - » open hardware;
- support open infrastructures;
- encourage adoption *via* funders, research institutions, journal editorial boards and learned societies.

☑ **Ensuring diversity, open, transparent and equitable access** and supporting non-commercial publishing models and collaborative publishing models with no charges by:

- adhering to the principles of open, transparent and equitable access;
- supporting non-commercial publishing models;
- fostering collaborative publishing models with no article processing charges or book processing charges.

☑ **Addressing inequality and protecting against predatory behaviours** by enforcing effective governance measures and proper legislation in order to:

- address inequality;
- protect against predatory behaviours;
- protect the intellectual creation of open science methods, products and data.

☑ **Promoting high-quality and responsible research**, in line with the 2017 UNESCO Recommendation on Science and Scientific Researchers, and exploring the potential of open science practices to reduce scientific misconduct, including the fabrication and falsification of results, violation of scientific ethical norms and plagiarism.

Promoting innovative approaches for open science at different stages of the scientific process by:

☑ **Encouraging community-driven collaboration and other innovative models by:**

- promoting open science from the outset of the research process;
- extending the principles of openness in all stages of the scientific process to improve quality and reproducibility;
- encouraging community-driven collaboration and other innovative models, such as preprints (clearly distinguished from final peer-reviewed publications);
- respecting the diversity of scientific practices, in order to accelerate the dissemination of, and encourage rapid growth in, scientific knowledge.

☑ **Promoting open peer review** as appropriate, including through:

- the possible disclosure of the identity of the reviewers;
- publicly available reviews;
- public acknowledgement of the contribution made by reviewers;
- the possibility for a broader community to provide comments, participate in and be recognized as contributors to the assessment process.

☑ **Incorporating citizen science** and other forms of participatory science by developing new participatory methods and validation techniques to incorporate and value inputs from social actors beyond the traditional scientific community. This work includes citizen science, crowdsource-based scientific projects, citizen involvement in community-owned archival institutions and other forms of participatory science.

☑ **Encouraging and valuing the publication and sharing of negative scientific results**, including those results and associated data that do not conform to the outcomes expected by the researchers who carried out the science. These results also contribute to the advancement of scientific knowledge.

Promoting international and multi-stakeholder cooperation in open science and aiming to reduce digital, technological and knowledge gaps by:

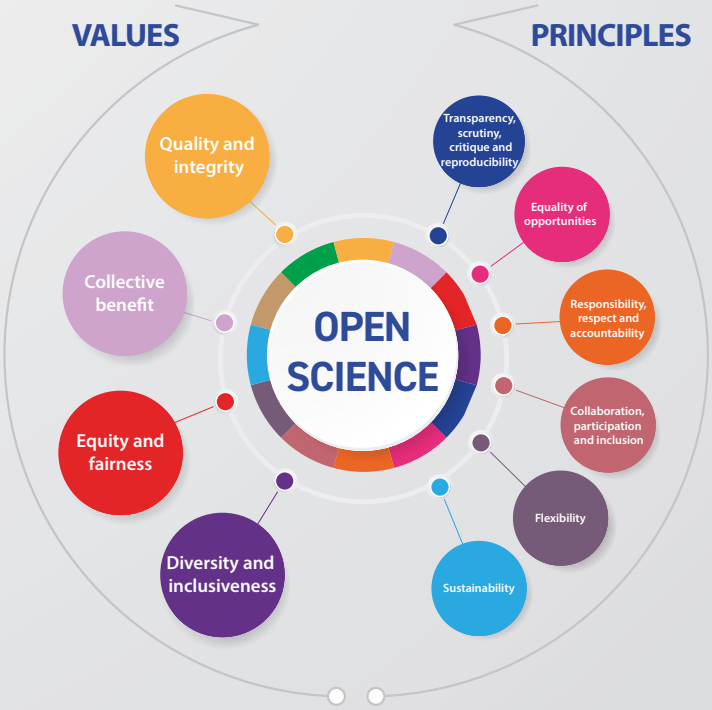
☑ **Encouraging international scientific collaborations** as:

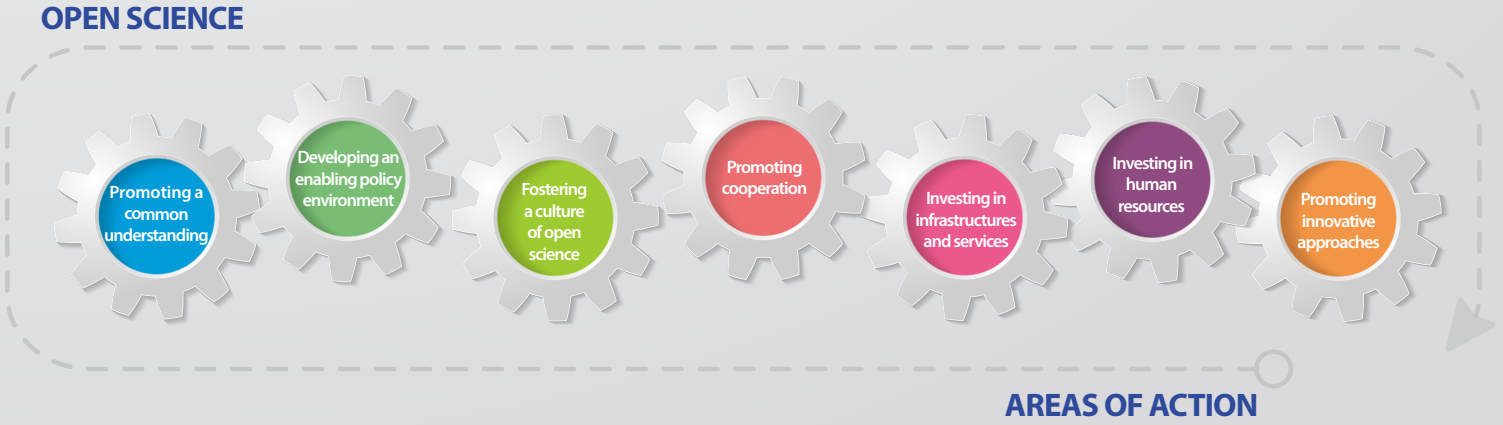
- one of the integral practices of open science;
- an essential driving factor for an intensive exchange of scientific knowledge and experience;
- paramount for the openness of science.

☑ **Promoting international collaboration on metrics for open science** by working with organizations involved in scholarly communication to agree on shared open science metrics that support all elements of the Recommendation and its implementation.

UNESCO Recommendation on Open Science at a Glance

The **Recommendation on Open Science**, the first international standard setting instrument on open science, was adopted by 193 countries in November 2021 at the 41st session of the UNESCO General Conference. The Recommendation provides an internationally agreed definition and a set of shared values and guiding principles for open science. It also identifies a set of actions conducive to a fair and equitable operationalization of open science for all at the individual, institutional, national, regional and international levels.





This document was introduced at a March 2022 OASPA webinar (Policy into Action: the UNESCO Recommendation on Open Science under the spotlight - actions for publishing) focused on publishing models, successes and challenges for open access publishing in line with the Recommendation. The document was then shared more widely throughout the open access publishing community. We are grateful to everyone who took the time to review the document and add their comments. This version was prepared by Claire Redhead, OASPA (claire.redhead@oaspa.org) and Iryna Kuchma, EIFL (iryna.kuchma@eifl.net) in April 2022. If you have used these guidelines in your own work to implement the UNESCO Recommendation, please contact us - all feedback is welcome.