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United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation,
la science et la culture

Organización
de las Naciones Unidas
para la Educación,
la Ciencia y la Cultura

Организация
Объединенных Наций по
вопросам образования,
науки и культуры

منظمة الأمم المتحدة
للتربية والعلم والثقافة

联合国教育、
科学及文化组织

Item 5.20 of the provisional agenda

40 C/63

8 October 2019

Original: English

PRELIMINARY STUDY OF THE TECHNICAL, FINANCIAL AND LEGAL ASPECTS OF THE DESIRABILITY OF A UNESCO RECOMMENDATION ON OPEN SCIENCE

OUTLINE

Source: 206 EX/Decision 9

Background: This initiative is inscribed in the continuity and follow-up of the UNESCO Recommendation on Science and Scientific Researchers, approved by the General Conference at its 39th session in 2017, and the UNESCO Strategy on Open Access to scientific information and research, approved by the General Conference at its 36th session in 2011.

The objective of this document is to present the preliminary findings of the study of the desirability for UNESCO's action, programmatic and regulatory, in the field of Open Science. A possible UNESCO Recommendation on Open Science is presented as an option, to affirm UNESCO's normative and standard-setting role in this regard.

Purpose: Following 206 EX/Decision 9, and according to the Rules of Procedure concerning recommendations to Member States and international conventions covered by the terms of Article IV, paragraph 4, of the Constitution, the present document contains a copy of the preliminary study, as presented at the 206th session of the Executive Board, and the Executive Board's observations and decisions thereon.

Decision required: paragraph 8.



Job: 20191120x

INTRODUCTION

1. The Executive Board, at its 206th session, considered document 206 EX/9 containing the preliminary study of the technical, financial and legal aspects of the desirability of a UNESCO recommendation on open science.

2. The Executive Board subsequently decided (206 EX/Decision 9) to include an item on the technical, financial and legal aspects of the desirability of a standard-setting instrument on Open Science in the provisional agenda of the 40th session of the General Conference, and invited the Director-General to submit to the General Conference at its 40th session the preliminary study on the technical, financial and legal aspects of the desirability of a standard-setting instrument on Open Science contained in document 206 EX/9, together with the relevant observations and decisions of the Executive Board thereon, in particular the need to overcome the digital, technological and knowledge divide existing between developed and developing countries, especially regarding least developed countries and small island developing States.

3. Having examined the abovementioned document, the Executive Board expressed general support for an enhanced engagement of UNESCO on the programmatic and normative actions related to Open Science. The Member States highlighted the important links between Open Science and the achievement of the 2030 Agenda for Sustainable Development and the potential of Open Science in bridging the scientific knowledge divide.

4. While there was interest in a possible UNESCO Recommendation on Open Science, several issues were raised during the debate. These include:

- the need for a clear definition of Open Science and its scope;
- the need for a multistakeholder global and regional consultative processes, including with Member States, the scientific community as a whole, the key scientific international and national institutions and entities, other relevant United Nations agencies; citizens and traditional knowledge holders;
- the need to address issues of intellectual property rights and copyright;
- issues regarding the implementation of the legal framework;
- issues relating to data protection and data privacy;
- the need to share and build on lessons learned from existing Open Science initiatives;
- the need to ensure that open science truly benefits developing countries, LDCs and SIDS in particular;
- the importance of working across all the UNESCO sectors, and links to the relevant existing UNESCO programmes and initiatives, such as the draft Recommendation on Open Education Resources, the work on artificial intelligence and the follow-up of the updated Recommendation on Science and Scientific Research;
- the need for adequate funding from extrabudgetary sources.

5. The Board also invited the Director-General to continue holding intergovernmental consultations *in presentia*, with a view to the possible elaboration of a Recommendation on Open Science, and requested the Director-General to present a consolidated roadmap to its session. In this context, an information meeting on the draft Roadmap with Member States was held on 20 June 2019 at UNESCO Headquarters in Paris and the draft consolidated roadmap, including the comments from the abovementioned information meeting, will be discussed at the 207th session of the Executive Board.

6. In addition, a meeting with the African Union and the scientific community is planned before the end of 2019.

7. The original document submitted to the Executive Board at its 206th session (206 EX/9), along with the Executive Board related decision (206 EX/Decision 9), is presented in the Annex to this document.

8. In light of the above, the General Conference may wish to adopt a resolution along the following lines:

The General Conference,

Recalling the Rules of Procedure concerning recommendations to Member States and international conventions covered by the terms of Article IV of the Constitution,

Having examined document 40 C/63,

1. *Recognizes* the need for a new standard-setting instrument on open science, in the form of a recommendation;
2. *Invites* the Director-General to continue holding intergovernmental consultations in praesentia for the elaboration of the recommendation;
3. *Also invites* the Director-General to submit to it for consideration at its 41st session a draft text of a UNESCO recommendation on open science, provided the resources are available.

ANNEX

206 EX/Decision 9 – Preliminary study of the technical, financial and legal aspects of the desirability of a UNESCO recommendation on open science (206 EX/9; 206 EX/ 47.I)

The Executive Board,

1. Having examined document 206 EX/9,
2. Decides to include an item on the technical, financial and legal aspects of the desirability of a standard-setting instrument on open science in the provisional agenda of the 40th session of the General Conference;
3. Invites the Director-General to submit to the General Conference at its 40th session the preliminary study on the technical, financial and legal aspects of the desirability of a standard-setting instrument on open science contained in document 206 EX/9, together with the relevant observations and decisions of the Executive Board thereon, in particular, the need to overcome the digital, technological and knowledge divides existing between developed and developing countries, especially least developed countries and small island developing States;
4. Also invites the Director-General to continue holding intergovernmental consultations *in praesentia* with a view to the possible elaboration of a recommendation on open science;
5. Requests the Director-General to present a consolidated roadmap to it at its 207th session.



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Educational, Scientific and
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Executive Board

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PRELIMINARY STUDY OF THE TECHNICAL, FINANCIAL AND LEGAL ASPECTS ON THE DESIRABILITY OF A UNESCO RECOMMENDATION ON OPEN SCIENCE

SUMMARY

This initiative is inscribed in the continuity and follow-up of the UNESCO *Recommendation on Science and Scientific researchers*, approved by the General Conference at its 39th session in 2017 and the UNESCO *Strategy on Open Access to scientific information and research* approved by the General Conference in its 36th session in 2011.

The overall objective of this document is to present the preliminary findings of the study of the desirability for UNESCO's action, programmatic and regulatory, in the field of Open Science. A possible UNESCO Recommendation on Open Science is presented as an option to affirm UNESCO's normative and standard-setting role in this regard.

Action expected of the Executive Board: proposed decision in paragraph 39.

INTRODUCTION

1. The objective of this document is to present the desirability and options for UNESCO action – normative or other action – in the field of Open Science.
2. *UNESCO Recommendation on Science and Scientific Researchers (2017)* states that ‘open communication of the results, hypotheses and opinions – as suggested by the phrase “academic freedom” – lies at the very heart of the scientific process.’ In close relation to this underlying tenet of the Recommendation on Science, Open Science is the name of a movement to make scientific research and data accessible to all (see UNESCO Global Open Access Portal (GOAP)).
3. More specifically, Open Science calls for practices and institutions that:
 - (a) ensure that published scientific research is easily and timely accessible to the global community of scientists and the public while maintaining high quality;
 - (b) ensure all research results, methods and data are published or accessible in ways that facilitate other scientists to review, replicate, and avoid unproductive duplication of research, while respecting privacy, copyright and other regulations;
 - (c) make it easier and affordable to publish and communicate scientific knowledge especially through education systems;
 - (d) facilitate accessibility and other practices relating to the Open Science ideals for tools, processes and contents of scientific research;
 - (e) make science transparent, for example through open science notebook;
 - (f) establish and ensure long-term sustainability of data repositories and platforms and set standards for co-creation and collaboration;
 - (g) spread scientific culture, encourage participation and access in science communication mechanisms such as science centres and museums;
 - (h) foster citizen science organizations; widespread formal and informal science education;
 - (i) promote open source software and crowd-funded research projects.
4. Open Science practices and initiatives also relate to the movement on Open Educational Resources, which promotes openly licenced teaching and learning resources and with the broader Open Education movement.
5. Open Science, once established, is expected to strengthen scientific culture and promote equal opportunities for all including through enhanced involvement of citizens in research activities and an increased access to scientific data and information and open education resources. Open Science has also the potential to foster aspects of democratic governance by spreading knowledge and capacity for understanding that allows informed democratic engagement by a wider public. It further improves access to science for the sake of science journalism and countering fake news.
6. Increased access to and participation/engagement in science, technology and innovation also allow people to adapt new practices and technologies that are appropriate to their conditions. Open Science could be a game changer for achieving the Sustainable Development Goals, particularly in Africa, least developed countries, landlocked developing countries, and small island developing States (SIDS), if it significantly increases scientific discovery and facilitates adoption of the well-adapted technologies.

The Open Science Transition

7. Recent years have seen significant increase of Open Science practices and institutions at national, regional and international levels and an increasing political commitment for investment to ensure the transition to more inclusive, participatory, accessible and transparent science, technology and innovation systems. Notable political commitments include the Amsterdam Call for Action on Open Science, the Budapest Open Access Initiative, the Panton Principles, or the Jussieu Declaration for Open Science and bibliodiversity.

8. To present some examples:

- (a) In the European Union, the Open Science goal is materialising in the context of the European Open Science Policy Platform and through the development of a European Science Cloud, new requirements for EU-funded research, and open access to scientific data generated by a number of Horizon 2020 projects, in particular in the context of guidance from an international initiative called GO-FAIR. Open access to scientific literature is promoted through initiatives such as Plan S, which join the open access movements from other parts of the world, namely La Referencia, in Latin America, Asia OA – Open Access, COAR – Confederation of Open Access Repositories, and others. Because some of the world's highest-scoring innovating economies are demonstrating that this transition offers returns on this investment, Open Science may be at the brink to change practices globally, if the widest possible community of scientists adopt the practices. It also has the potential to enhance science and citizen led approaches to responsible research and innovation to bring transparency across the science, technology and innovation system.
- (b) In Africa, the African Open Science Platform has recently been launched demonstrating the importance of Open Science for Africa and for countries that need to strengthen their scientific systems and benefit from the results of science produced worldwide. The Platform is expected to raise awareness about the importance of Open Science and open data for Africa.
- (c) In the United States, the Federal Crowdsourcing and Citizen Science Act was signed into law in January 2018 and Open Science Prizes are being established to promote open science research in different fields, including health and environment.

9. There are also numerous other initiatives at led by governments, science foundations or universities.

Implications and Significance of Open Science

10. Open Science practices have been found to yield benefits to economic and social development. Because they also point toward improved access to scientific knowledge and enable widened participation in science as well as encouraging publication, the Open Science model applied internationally is fully coherent with advancing human rights, and internationally agreed development goals. Many of the actions taken by Member States will be compliant to the specific norms set out in the UNESCO Recommendation on Science and Scientific Researchers. The Open Science concept is therefore one meriting more examination by UNESCO Member States.

11. Open Science fosters science as an enterprise that is inclusive and of highest quality. The methods are conducive to scientific collaboration and discovery across scientific fields, taking fullest advantage of the proliferation of data, instantaneity of communications, and digitalization of knowledge storage systems (globalization and digitalization). Open Science is expected to significantly improve the capacity and efficiency of national science and technology systems, and may quickly lead to adjustments to the global science enterprise as a whole, particularly affecting science publishing. The transition to Open Science practices may also require re-training, new

protocols and possibly regulation and institutions. The methods, good practices and institutions at international level are in the process of being defined.

OPEN SCIENCE AND UNESCO

12. As the United Nations specialized agency dedicated to science cooperation, UNESCO holds a particular responsibility to advocate the internationally agreed human right to science¹. This right places emphasis on participation in science as well as accessibility of the knowledge which science produces. How Open Science will be implemented raises important questions in these very areas. UNESCO has taken consistent positions favourable to open scientific exchange across borders and across ideological divides and its programming and legal instruments have remained consistent in this area over its 70 years of existence.

13. Open Science in the future will build upon the Organization's leadership role on World Summit on Information Societies processes, where it has been responsible for the action line (C3 and C7) on e-Science and access to information since 2003. This work will also build upon the 10-year Strategy on Open Access to Scientific Information and Research, approved by the UNESCO's General Conference at its 36th session, and the internationally-agreed normative framework for science in the UNESCO Recommendation on Science and Scientific Researchers.

14. Since taking a lead in the WSIS process and e-science, UNESCO has been advocating Open Science by providing support to Open Access policy development, improving awareness and utility of Open Science, and providing various solutions to institutionalize Open Science. UNESCO's Communication and Information Sector has identified a policy vacuum on scientific communication, and provides upstream technical advice to its Member States and their scientific institutions on their development of Open Science policies. This involves, *inter alia*, building the capacity of national decision-makers and personnel of research institutions to draft and implement policies. UNESCO also mobilizes its convening power to regularly organize regional consultations on open access to scientific information and research.

15. UNESCO's Open Access to Scientific Research initiative, through its Global Open Access Portal (GOAP) is at present promoting Open Science concepts. Because the Open Access (OA) to scientific information is a global endeavour, UNESCO has strengthened it through partnerships and collaborations with publishers, universities, research institutions, libraries and specialized national and international non-governmental organizations (NGOs). UNESCO has established a Network for Open Access to Scientific Information and Research (NOASIR) currently rolled out as the Open Scholarship Initiative. It initiative supports institutionalizing OA archives and journals in various disciplines; encourages researchers and scientists to publish in OA journals and to deposit their works in OA repositories; encourages publishers to offer more journals and articles in OA; supports research and development in OA technologies, policies and practices; provides access to scientific journals to developing countries; and serves as a laboratory for innovation and catalyst for international cooperation.

16. UNESCO has played a key role of standard setter in OA by developing curricula and courses for Library and Information Science Schools in Member States. UNESCO has recently endorsed Ameli CA, as yet another mechanism on Open Science dedicated to Sustainable Development and South-South cooperation.

17. In addition, Open Science policy instruments are incorporated into the UNESCO GO-SPIN Platform. UNESCO has advocated for keeping Open Science high on the agenda of the international

¹ See e.g. Article 27 of the Universal Declaration of Human Rights (1948): "Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits".

Forums co-organized by UNESCO, such as the World Summit on the Information Society, the World Science Forum and the United Nations Multistakeholder Science Technology and Innovation Forum.

18. Two recent initiatives deserve noting: the UNESCO 2018 celebrations of the World Science Day for Peace and Development, with a roundtable consecrated to “Open science: barriers, benefits, enabling conditions and the role of policies”; and the official visit to UNESCO of the European Commissioner for Science, Research and Innovation, Carlos Moedas, in December 2018, with the main objective of promoting Open Science and strengthening links between the European Commission and UNESCO in this line of action.

19. In her response to the 205th session of the Executive Board, the UNESCO Director-General welcomed the call for UNESCO to play a strong role in this area and confirmed that an Open Science initiative was in line with the standard-setting role of the organization, as a way of making scientific research and data accessible to those who still lack them, while recognizing the fundamental role of inclusive science for democracy, sustainable development, and the fight against poverty and inequality.

20. Any strengthened action by UNESCO in the area of Open Science would be inscribed in its efforts to implement the *UNESCO Recommendation on Science and Scientific Researchers (2017)* and would also enhance the efforts of the Organization to promote and reinforce Article 27 of the Universal Declaration of Human Rights. It would also strengthen UNESCO’s contribution to the achievement of Sustainable Development Goals, in particular target 9.5 on scientific research and target 12.a on science capacities.

THE POTENTIAL FOR UNESCO’S PROGRAMMATIC AND REGULATORY ACTION

The Existing Legal Framework

21. Open Science touches on different activities of scientists guided by a variety of international legal frameworks such as their collaborations and travel, publishing, their application of various regulations and codes (data management, privacy, data sharing, chemicals transport and biopiracy, ethics, environment) their application of rules in the contexts of their employment contracts and funding regimes, etc. Clearly, the legal framework is complex, and evolving. There is at present no single and unique global agreement covering all aspects of Open Science. Nevertheless, there is one recent legal instrument that sets out some general principles and norms of Open Science. This instrument is the *UNESCO Recommendation on Science and Scientific Researchers (2017)* (hereinafter, the Recommendation on Science).

22. During the four years of consultations leading to the adoption of the latter, numerous Member States and collaborators evoked the transition to Open Science as one of their great challenges. Because they did, the 2017 internationally-agreed norms set out in the Recommendation on Science were specifically designed to address not just Member States, scientists and their employers, but also institutions and individuals responsible for research and development and other aspects of science, including such as science education, science communication, regulation and policy, oversight, funding, recruitment, peer review and scientific publishing.

23. For example, the Recommendation on Science requires that Member States establish and facilitate mechanisms for collaborative open science and facilitate sharing of scientific knowledge and benefits, in the name of specific human rights (paras. 21, 22). It requires Member States “to do everything possible to help scientific researchers” in relation to international aspects of the conduct of science.

24. Recognizing that there will be changes for scientific publishing and international collaboration and sharing of data as well as in science education, the Recommendation on Science also recalls that Member States should establish firmly as the norm for all scientific publishing, including

publishing in open access journals, that peer review based on established quality standards for science is essential (para. 26). It further calls on Member States to look upon science “as a public good, and to promote it as such ...” and specifically indicates that Member States should promote broadly STEM education (para 14 (a)), and “take measures to ensure equitable and open access to scientific literature, data and contents including by removing barriers to publishing, sharing and archiving of scientific outputs” (para 13 (e)). Indeed, Member States are tasked to “ensure equal access to science and knowledge derived from it” (para. 18 (b)).

25. Finally, the Recommendation on Science says it is a responsibility of each scientific researcher “to promote access to research results and engage in the sharing of scientific data between researchers, and to policy-makers, and to the public wherever possible, while being mindful of existing rights”. Institutions are called on to support the researchers in this specific regard (para. 16). The Member States are tasked to promote and support this open scholarship of scientific researchers, to promote open access to literature and research data (para. 27), to adjust appraisal systems to ensure that there are incentives for Open Science (para. 34), to ensure all research is published and that the data, methods and software that were used be made accessible (para. 35), and to encourage that scientists participate in the international scientific community, sharing and open access publishing (paras 31, 35-37, 39).

26. Yet, more specific Open Science norms protocols and regulation may still be needed at the international level to ensure the transition to Open Science advances smoothly and balances in appropriate ways the respect for data privacy, confidentiality and intellectual property.

Towards Enhanced Regulatory Action on Open Science

27. Some of the world’s most innovative economies have invested in and are beginning to demonstrate that Open Science practices can fulfil high aspirations, helping them build human and institutional capacity in their science, technology and innovation systems. While the international scientific community increasingly embraces open science approaches, there is still a pressing need to foster links between knowledge holders/producers and users, to foster fair and equitable international North-South, South-South and triangular cooperation, and to support an Open Science transition in all parts of the globe by offering support to some countries. Open science is fuelling innovation, but there remain global divides.

28. International level protocols and institutions may be needed to address the data/knowledge sharing challenges inherent to Open Science. Appropriate infrastructure, including trusted web-based repositories and storage capacity are equally important in making data publicly accessible and useable.

29. Open Science raises very important issues from the legal point of view at international level. Mismatched practices already pose challenges for international scientific cooperation. Sharing results and data requires legal protections for (e.g. for personal privacy and intellectual property) yet there remain disparities in access to justice that make the application of protections uneven and uncertain. Open Science in practice will require Open Science literacy and skills training, the participation of citizens and whole countries in the global enterprise of science, and may raise issues of how to protect human rights, and how to best ensure professional ethics and productivity.

30. In light of a proliferation of Open Science operational, policy and legal frameworks, there may be a need to reach a global consensus on Open Science and to establish more clearly and specifically the shared values, norms, principles and standards at the international level, aiming at a framework conducive to an Open Science transition.

DESIRABILITY OF A RECOMMENDATION ON OPEN SCIENCE

31. According to the UNESCO Constitution, the Organization should realize its purpose, namely maintaining, increasing and diffusing knowledge: (i) by assuring the conservation and protection of the world's inheritance of books, works of art and monuments of history and science, and recommending to the nations concerned the necessary international conventions; (ii) by encouraging cooperation among the nations in all branches of intellectual activity, including the international exchange of persons active in the fields of education, science and culture and the exchange of publications, objects of artistic and scientific interest and other materials of information; (iii) by initiating methods of international cooperation calculated to give the people of all countries access to the printed and published materials produced by any of them. Although written more than seventy years ago, these tasks are still highly up-to-date, especially in light of the issues raised by Open Science.

32. In the Article IV of the aforementioned UNESCO Constitution, two normative instruments are envisaged to be approved by the General Conference: recommendations and international conventions.

33. Declarations are another means of defining norms, which are not subject to ratification. Like recommendations, they set forth universal principles to which the community of States wished to attribute the greatest possible authority and to afford the broadest possible support.

34. Taking into account the current aspects of Open Science debates and previous actions taken by UNESCO, a Recommendation on Open Science could be the most appropriate form of the instrument to be used. In this way, UNESCO can affirm on the international scene its comparative advantage over other international organizations.

35. It is important to note that the adoption of a normative instrument can be of the utmost importance. However, as important as the text itself is the discussion process leading to its drafting and approval, as well as the subsequent process of follow-up and implementation. It is very important that this process be exemplary, involving all the people who, within and outside UNESCO, are concerned with this issue and getting all Member States involved. The success of this initiative on Open Science depends on the quality and involvement of all stakeholders in this process. Also, the process will have to take into account the ongoing movement toward defining international norms in the Open Educational Resources area.

36. A possible UNESCO Recommendation on Open Science might address issues such as:

- definition and description of the main components and key stakeholders of Open Science at national, regional and international levels,
- discussion of impacts of Open Science on the scientific endeavour and society at large, particularly in the context of emerging science systems in Africa,
- proposals for alternatives for the establishment of adequate legal and policy frameworks for Open Science, as well as instruments for its implementation in Member States,
- tools for monitoring the implementation of the recommendation by Member States and UNESCO.

37. By virtue of its mandate and normative role, UNESCO now invites this debate on Open Science within the international community and consults Member States on possible courses of action, including programmatic and regulatory action. Should new standard-setting activities be decided, based on lessons learned from previous related experiences and on the ongoing discussions on Open Science, it would be strongly recommended to establish a wide multi-stakeholder consultative mechanism on the topic of Open Science. Such a consultative mechanism should invite the input of

all Member States, as well as their scientists' and young researchers' communities, academics, intellectuals, and civil societies at large. Such an initiative would require financial means. The process could result in the submission of a standard-setting instrument to the General Conference in 2021.

38. It is estimated that broad outreach and global consultations as part of the preparatory work for delivery of a draft regulatory instrument, such as a Recommendation would have an overall cost of US \$1.95 million. Given UNESCO's financial situation, the budget would need to be fully covered by extrabudgetary contributions (see Annex for a Draft Roadmap).

39. In the light of the above, the Executive Board may wish to adopt a decision along the following lines:

The Executive Board,

1. Having examined document 206 EX/9,
2. Decides to include an item on the technical, financial and legal aspects of the desirability of a standard-setting instrument on Open Science in the provisional agenda of the 40th session of the General Conference;
3. Invites the Director-General to submit to the General Conference at its 40th session the preliminary study on the technical, financial and legal aspects of the desirability of a standard-setting instrument on Open Science contained in document 206 EX/9, together with the relevant observations and decisions of the Executive Board thereon;
4. Recommends that the General Conference at its 40th session invite the Director-General to submit, provided the resources are available, a draft text of a new standard-setting instrument on Open Science, in the form of a recommendation, for consideration by the General Conference at its 41st session.

ANNEX

DRAFT ROADMAP FOR A POSSIBLE UNESCO RECOMMENDATION ON OPEN SCIENCE

1. The implementation of this initiative would involve SC, CI, and SHS, through a joint coordination team led by SC. A team of Open Science experts would be established to:
 - (i) Elaborate an inventory of ongoing work on Open Science across UNESCO;
 - (ii) Identify the existing mechanisms and documentation on Open Science within the United Nations and relevant regional groupings of states;
 - (iii) Organize a large consultation with Member states, National Commissions, networks of young and experienced researchers, academics, public and private scientific institutions;
 - (iv) Develop studies, preparatory briefs and a Roadmap for the Recommendation, between 2019 and 2021.

2. The work would involve the participation of a large network of partners, *inter alia*:
 - (i) UNESCO Chairs and Centers; and university associations such as AAU;
 - (ii) The International Council for Science;
 - (iii) Institutions like SESAME, and CERN, with whom UNESCO developed the free digital library *Invenio* used in Africa for capacity building;
 - (iv) The Global Young Academy, which is the voice of young scientists all around the world;
 - (v) The United Nations Technology Facilitation Mechanism, in particular its Inter Agency Task Team on Science, Technology and Innovation for SDGs;
 - (vi) The African Open Science Platform, developed by the International Council for Science with the support of UNESCO.

3. The timeline for the development of this initiative would be as follows:
 - A. Project preparation phase: January to October 2019**
 - (i) Inventories of the existing mechanisms and documentation on Open Science;
 - (ii) Preparation of the preliminary study on the technical, financial and legal aspects on the desirability of a standard-setting instrument on Open Science, including a draft Roadmap, based on the *Rules of Procedure concerning recommendations to Member States and international conventions covered by the terms of Article IV, paragraph 4, of the Constitution*;
 - (iii) Submission of the preliminary study and the draft Roadmap to the Executive Board at its 206th session (April 2019);
 - (iv) Setting up of a large partnership on Open Science;
 - (v) Organization of a large electronic consultation with UNESCO Chairs, C2Cs, external partners, National Commissions and Member States;
 - (vi) Consolidation of the Roadmap;

- (vii) Consideration of the consolidated Roadmap by the Preparatory Group;
- (viii) Organization of an Information meeting for Member States on the consolidated Roadmap (September 2019).

B. Consolidation and deployment phase: October 2019 to February 2020

- (i) Submission of the preliminary study on the technical, financial and legal aspects on the desirability of a standard-setting instrument on Open Science, including its consolidated Roadmap, to the General Conference at its 40th session (November 2019);
- (ii) Publication of a brochure for the general public on the initiative, based on the preliminary study and observations of UNESCO's governing bodies (December 2019).

C. Implementation phase and adoption of the Recommendation: March 2020 to February 2022

- (i) Preparation of the first draft text of the Recommendation (March 2020);
- (ii) Consultation with stakeholders on the first draft text of the Recommendation: (a) UNESCO centres and Chairs, and key science partners; (b) Open consultation to key scientists, young researchers, university professors, academicians and intellectuals, engaged citizens, and relevant public and private entities (April 2020);
- (iii) Organization of six regional meetings (one in each region). This will nurture the work with region-related considerations and the regional scientific cultures (from May to October 2020);
- (iv) Communication of the Director-General's preliminary report on the proposed recommendation, accompanied by the first draft of the recommendation, to the Member States (September 2020) for their comments by end January 2021;
- (v) On the basis of the comments received by Member States, communication of the Director-General's final report containing a draft of the recommendation to the Member States (April 2021);
- (vi) Submission of the final report to the special committee consisting of technical and legal experts appointed by Member States (category II meeting) (July 2021);
- (vii) Submission of the draft recommendation to the General Conference at its 41st session with a view to its adoption (November 2021);
- (viii) Organization of a Global Conference to present the Recommendation adopted by the General Conference at its 41st session (February 2022).



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ADDENDUM

CONSOLIDATED ROADMAP FOR A POSSIBLE UNESCO RECOMMENDATION ON OPEN SCIENCE AND DRAFT TERMS OF REFERENCE FOR THE OPEN SCIENCE ADVISORY COMMITTEE

OUTLINE

Source: 207 EX/Decision 7.

Further to the Executive Board decision, 207 EX/Decision 7, this document proposes the draft Terms of Reference for the Open Science Advisory Committee for consideration by the General Conference at its 40th session as addendum to document 40 C/63.

Decision required: paragraph 5.



Job: 201914018

INTRODUCTION

1. Following up to 206 EX/Decision 9, the Director-General presented to the Executive Board at its 207th session, the requested “Consolidated roadmap towards a possible UNESCO recommendation on open science” (see Annex I to this document).
2. In its decision (207 EX/Decision 7)¹ the Executive Board took note of the consolidated roadmap presented in the above-mentioned document.
3. While noting “the importance of ensuring an open and transparent process based on a proper geographical gender balance for the selection of the members of the Advisory Committee”, in their decision, the members of the Executive Board have also:
 - requested the Director-General “to ensure a broad and geographically representative Open Science Partnership, with relevant stakeholders and institutions from all regions and from all branches of Basic and Applied Sciences, including Natural Sciences , and Social and Human Sciences, particularly taking into account local and indigenous peoples and their traditional knowledge”;
 - recommended that “the specific challenges of scientists in developing countries in regards to weak Science Technology and Innovation (STI) policy and legal systems, and the digital, technological and knowledge divides, be adequately addressed within the consolidated Roadmap and future recommendation to enable the scientists to fully participate and reap the benefits of the Open Science framework”;
 - recommended that the General Conference, at its 40th session, “request the Director-General to hold at least one category II intergovernmental meeting *in presentia* with a view to the elaboration of a recommendation on Open Science”;
 - recommended to the Director-General “to elaborate a draft Terms of Reference of the Open Science Advisory Committee to be presented at the 40th session of the General Conference, for its consideration”.
4. Further to the request above, the draft Terms of Reference are presented in Annex II to this document.

Proposed draft resolution

5. In view of the above, the General Conference may wish to adopt a decision along the following lines (this draft resolution replaces the one contained in paragraph 8 of document 40 C/63):

The General Conference,

Recalling the Rules of Procedure concerning recommendations to Member States and international conventions covered by the terms of Article IV, paragraph 4, of the Constitution,

Having examined documents 40 C/63 and 40 C/63 Add,

1. *Recognizes* the need for a new standard-setting instrument on open science, in the form of a recommendation;
2. *Takes note* of the terms of reference of the Open Science Advisory Committee, as contained in Annex 2 to document 40 C/63 Add.;

¹ 207 EX/Decision 7 is available in its entirety in Annex III to this document.

3. *Invites* the Director-General to initiate, in accordance with the applicable rules and provided the resources are available, the process of elaborating a draft text of a new standard-setting instrument on open science, in the form of a recommendation;
4. *Requests* the Director-General to hold at least one category II intergovernmental meeting *in presentia* with a view to the elaboration of a recommendation on open science;
5. *Also requests* the Director-General to take all necessary measures to ensure an inclusive consultative process leading to a recommendation on open science;
6. *Also invites* the Director-General to submit to it at its 41st session the draft text of a UNESCO recommendation on open science in accordance with the Rules of Procedure concerning recommendations to Member States and international conventions covered by the terms of Article IV, paragraph 4, of the Constitution.

ANNEX I

CONSOLIDATED ROADMAP TOWARDS A POSSIBLE UNESCO RECOMMENDATION ON OPEN SCIENCE²

The organization of the process leading to the possible adoption of the UNESCO Open Science Recommendation

1. The three-year (2019-2021) consultative, inclusive and transparent process leading to the possible adoption of the Recommendation will be led by UNESCO Member States and:
 - Facilitated by an internal multisectoral UNESCO Open Science Team;
 - Supported by a broad Open Science Partnership;
 - Steered by an Open Science Advisory Committee;
2. The internal multisectoral UNESCO Open Science Team, coordinated by SC, will include representatives from the five programme sectors (SC, CI, ED, CLT and SHS). Its objectives will be to:
 - Elaborate an inventory of ongoing work on Open Science across UNESCO;
 - Identify the existing mechanisms and documentation on Open Science within the United Nations and relevant regional groupings of states;
 - Develop the relevant studies, preparatory briefs and a draft Roadmap for the Recommendation, as presented in this document, for the consideration of the UNESCO Member States;
 - Organize large consultations with Member states, National Commissions, networks of young and experienced researchers, academics, public and private scientific institutions on:
 - the definition of Open Science;
 - the Scope of the draft Recommendation;
 - the Provisions of the draft Recommendation;
 - Organize the consultations among the Member States leading to the possible adoption of the Recommendation by the UNESCO General Conference in 2021.
3. The broad **Open Science Partnership** will bring together all the relevant and interested Open Science stakeholders across the world. The Partnership will be open ended and include interested Member States, scientific community, public and private science, technology and innovation institutions, relevant private sector and industry, United Nations agencies. *Inter alia* the Partnership will include:
 - UNESCO Chairs and centres; and university associations such as the Association of African Universities;
 - The World Academy of Sciences (TWAS) and the International Centre for Theoretical Physics (ICTP);

² This document was presented to the Executive Board in the Annex to document 207 EX/7.

- The International Science Council (ISC);
 - Institutions such as the Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME) and the European Organization for Nuclear Research (CERN), with whom UNESCO developed the free digital library Invenio used in Africa for capacity-building;
 - The Global Young Academy, which is the voice of young scientists all around the world and has a Working Group on Open Science;
 - The United Nations Technology Facilitation Mechanism, in particular its Inter Agency Task Team on Science, Technology and Innovation for SDGs;
 - The World Intellectual Property Organization;
 - The African Open Science Platform, developed by the International Council for Science with the support of UNESCO;
 - European Union Open Science;
 - The Confederation of Open Access Repositories;
 - The African Academy of Science.
4. The **Open Science Advisory Committee** will be established to guide and advice on the process leading to the Recommendation. The 15 members will include, inter alia, representatives of Member States from the six electoral groups of UNESCO and representatives of key scientific bodies/institutions dealing with Open Science and interested donors. Its role will be to steer the consultative process leading to the Recommendation by:
- providing expert and strategic advice;
 - ensuring delivery of the process milestones;
 - providing support with fundraising.

Timeline

- A. Project preparation phase: January to October 2019 (already achieved)
- (i) Preliminary study prepared on the technical, financial and legal aspects on the desirability of a standard-setting instrument on Open Science, including a draft Roadmap, based on the *Rules of Procedure concerning recommendations to Member States and international conventions covered by the terms of Article IV, paragraph 4, of the Constitution*;
 - (ii) Preliminary study and the draft Roadmap submitted to the Executive Board at its 206th session (April 2019);
 - (iii) Bibliographic study on the definition(s) of Open Science initiated;
 - (iv) An information meeting organized for Member States on the draft consolidated Roadmap (June 2019).

- B. Consolidation and deployment phase: October to November 2019
- (i) Submission of the draft consolidated Roadmap to the Executive Board at its 207th session (October 2019);
 - (ii) Multi-stakeholder workshop on Open Science in Africa (October 2019-TBC);
 - (iii) Submission of the preliminary study and of the consolidated Roadmap, with the observations and decisions of the Executive Board at its 206th and 207th sessions, to the General Conference at its 40th session (November 2019).
- C. Implementation phase and adoption of the draft Recommendation (depending on the decision by the General Conference): December 2019 to February 2022
- (i) Publication of a brochure and other communication material (e.g. short video) for the general public on the initiative, based on the preliminary study, the roadmap and including observations of UNESCO's governing bodies (December 2019).
 - (ii) Establishment of the Open Science Partnership (December 2019)
 - (iii) Establishment of the Open Science Advisory Committee (December 2019)
 - (iv) Mobilization of Open Science Partnership and organization of an electronic consultation with UNESCO Chairs, C2Cs, external partners, National Commissions and Member States on the draft definition of Open Science and the scope of the Recommendation (January-February 2020);
 - (v) Based on the inputs received, preparation by the Secretariat of the first draft text of the Recommendation (March 2020);
 - (vi) Consultation with relevant stakeholders to collect inputs for the drafting of the Recommendation: (a) UNESCO centres and Chairs, and key science partners; (b) Open consultation with key scientists, young researchers, university professors, academicians and intellectuals, engaged citizens, and relevant public and private entities (April 2020);
 - (vii) Organization of six regional multistakeholder meetings (one in each region), including representatives of Member States (from May to September 2020) to collect comments on the first draft of the recommendation;
 - (viii) Communication of the Director-General's preliminary report on the proposed recommendation, accompanied by the first draft of the recommendation, to the Member States (September 2020) for their comments by end January 2021;
 - (ix) On the basis of the comments received by Member States, communication of the Director-General's final report containing a draft of the recommendation to the Member States (April 2021);
 - (x) Submission of the final report to the special committee consisting of technical and legal experts appointed by Member States (category II meeting) (July 2021);
 - (xi) Submission of the draft recommendation to the General Conference at its 41st session with a view to its adoption (November 2021);
 - (xii) Subject to adoption of the Recommendation by the General Conference at its 41st session, organization of a Global Conference to present the Recommendation will be foreseen in February 2022.

ANNEX II

DRAFT TERMS OF REFERENCE OF THE OPEN SCIENCE ADVISORY COMMITTEE

1. Background

Recognizing the potential of Open Science to democratize science and close the gaps in science technology and innovation, the Executive Board recommended the General Conference to invite the Director-General to initiate the process of elaborating a draft text of a new standard-setting instrument on Open Science in the form of a Recommendation, to be submitted for consideration by the General Conference at its 41st session (206 EX/Decision 9 and 207 EX/Decision 7).

In this context and further to the request of the Executive Board, the Director-General also presented a consolidated roadmap for a possible UNESCO Recommendation on Open Science (as contained in the Annex of the Executive Board Document 207 EX/7) describing the organization and the timeline of a consultative process leading to the adoption of a UNESCO Recommendation on Open Science in 2021.

As noted in the above-mentioned consolidated roadmap, the organization of the process leading to the possible adoption of the UNESCO Recommendation on Open Science in 2021 will be led by UNESCO Member States and:

- facilitated by an internal multisectoral UNESCO Open Science Team led by the Natural Sciences Sector;
- supported by a broad Open Science Partnership;
- guided by an Open Science Advisory Committee.

The current document provides the draft Terms of Reference of the Open Science Advisory Committee.

2. Role of the Open Science Advisory Committee

The Open Science Advisory Committee will be established by the Director-General of UNESCO to provide guidance and advice on the overall implementation of the Consolidated Roadmap for the UNESCO Recommendation on Open Science as contained in the Annex of the Executive Board Document 207 EX/7.

Its role will be to guide the consultative process leading to the Recommendation by:

- providing expert and strategic advice;
- ensuring delivery of the process milestones;
- providing support with fundraising.

In addition, the Advisory Committee will be invited to:

- propose relevant institutions and stakeholders to join the Open Science Partnership so as to ensure its geographical representativeness and broad scope covering all scientific disciplines and systems of knowledge;
- propose experts to take part in the regional and thematic consultations taking into account gender and geographical balance;

- contribute to and review any documentation that will be produced to accompany the consultative process leading to the Recommendation;
- communicate broadly on the importance of the Recommendation and the related work of UNESCO.

3. Membership of the Open Science Advisory Committee

3.1 Members

It is proposed that the Open Science Advisory Committee be composed of 15 members including:

- representatives of Member States from the six electoral groups of UNESCO;
- representatives of key scientific bodies and institutions dealing with Open Science;
- representatives of the private/business sector;

3.2 Guiding principles

The selection of the members of the Advisory Committee will be done by the Director-General of UNESCO based on an open and transparent process taking into account the following principles:

- geographical balance;
- gender balance;
- expertise and competence in the field of Open Science.

3.3 Co-chairs

At their first meeting, the Advisory Committee members will elect two co-chairs with the following responsibilities:

- setting the agenda for the meetings in consultation with the Secretariat;
- making sure that each meeting is planned effectively and that matters are dealt with in an orderly and efficient manner
- encouraging participation of all members of the Advisory Committee in the discussions;
- summarizing the conclusions of discussions, the decisions taken and the agreed follow up actions.

3.4 Observers

Observer(s) will be permitted to attend the meetings of the Advisory Committee. The observer should inform the Secretariat about its intention to attend the meeting no less than five business days before the scheduled meeting.

4. Operating procedures

4.1 Secretariat of the Advisory Committee

The Secretariat will consist of the internal multisectoral UNESCO Open Science Team.

4.2 Frequency of the Meetings

The Advisory Committee meetings will be organized at least twice a year in line with the key steps of the implementation phase of the consultative process as foreseen in the Consolidated Roadmap. Depending on the funds available and/or the willingness of the Members of the Advisory Committee to self-fund, meetings will be conducted face-to-face or virtually.

4.3 Documents for the Meetings

The Agenda of the meetings will be set by the Advisory Committee Co-chairs in consultation with the Secretariat. The Secretariat will prepare and distribute the Minutes of the meetings. Any other documents to be considered by the Advisory Committee will be decided by the Advisory Committee Co-chairs in consultation with the Secretariat and the members of the Advisory Committee.

4.4 Quorum and Decision-Making

Quorum for meetings will be attendance by a simple majority of Advisory Committee members. All decisions will be taken by consensus.

4.5 Reporting of the decisions of the Advisory Committee

The results of the discussion of the Open Science Advisory Committee are reported to the Director-General of UNESCO, via the Chair of the Committee.

ANNEX III

207 EX/Decision 7 – Consolidated Roadmap for a possible UNESCO Recommendation on Open Science

The Executive Board,

1. Having examined documents 207 EX/7 and 207 EX/PG/1.INF.3 and Corr.,
2. Takes note of the consolidated Roadmap towards the adoption of a possible UNESCO Recommendation on Open Science contained in the Annex to document 207 EX/7;
3. Notes the importance of ensuring an open and transparent process based on a proper geographical and gender balance for the selection of the members of the Advisory Committee;
4. Requests the Director-General to ensure a broad and geographically representative Open Science Partnership, with relevant stakeholders and institutions from all regions and from all branches of Basic and Applied Sciences, including Natural Sciences, Life Sciences, and Social and Human Sciences, particularly taking into account local and indigenous peoples and their traditional knowledge;
5. Recommends that the specific challenges of scientists in developing countries in regards to weak Science Technology and Innovation (STI) policy and legal systems, and the digital, technological and knowledge divides, be adequately addressed within the consolidated Roadmap and future recommendation to enable the scientists to fully participate and reap the benefits of the Open Science framework;
6. Recommends that the General Conference, at its 40th session, invite the Director-General, to initiate, in accordance with the applicable rules and provided the resources are available, the process of elaborating a draft text of a new standard-setting instrument on open science, in the form of a recommendation, to be submitted for consideration by the General Conference at its 41st session;
7. Also recommends that the General Conference, at its 40th session, request the Director-General to hold at least one category 2 intergovernmental meeting *in presentia* with a view to the elaboration of a recommendation on Open Science;
8. Also recommends the Director-General to elaborate a draft Terms of Reference of The Open Science Advisory Committee to be presented at the next General Conference, for its consideration.