



**Acesso Aberto  
Angola**

## **Objective 2.1**

**Draft roadmap for the development  
and adoption of an Open Access  
policy in Angola**



## Objective 2.1

Draft roadmap for the development and adoption of an Open Access policy in Angola

## Table of contents

<b>A FIRST PROPOSAL FOR AN OPEN ACCESS POLICY IN ANGOLA</b>	<b>4</b>
<b>Towards an Open Access, Open Science and Artificial Intelligence path in Angola: opening and integrating step by step</b>	<b>4</b>
Warning	4
INTRODUCTION AND MOTIVES	6
<i>UNESCO and knowledge societies as a Human Right</i>	6
<i>Science as law in the main universal declarations</i>	7
UNESCO and Open Science Recommendations	11
<i>Results of the Global Consultation on Open Science</i>	13
Open Science Recommendation, November 2021	16
Africa in the global context: some data from the UNESCO Science Report, towards 2030	21
Open Access and scientific production in the world, Africa and Angola: the perspective from Scopus	25
<i>The Open Access infrastructure of Africa and Angola: the perspective from ROARMAP</i>	30
A non-commercial route of scientific communication: Diamond Open Access	35
Towards an Open Access and an Open Science protected from commercial use and directed to the needs of each context	35
Open Access: openness versus equity	38
<i>The mainstream and the global conversation: loss of property and the transfer of resources to the global North</i>	42
THE CONSTRUCTION OF AN OPEN ACCESS IN ANGOLA	45
<i>The comprehensive diagnosis of Angola's scientific and editorial activity: the relevance of an Open Access policy in Angola</i>	45
Towards an Open Access policy in Angola: Opening and integrating step by step	48
<b>BIBLIOGRAPHY</b>	<b>55</b>

## Index of tables

Table 1	Volume of open scientific documents, 1996-2020. SJR, Scopus, 2021	25
Table 2	Volume of scientific documents published by country and identified in Scopus, 2021. SJR, Scopus,	2021
		26
Table 3	Scientific production of Angola (1996-2020) identified from Scopus. SJR, Scopus, 2021	28
Table 4	Open Access policies and mandates registered in ROARMAP, global context and African context. ROARMAP, 2021	32

## Index of figures

Figure 1	Geographic distribution of countries and regions participating in the global consultation on Open Science, (UNESCO, 2020b)	13
Figure 2	Most relevant aspects of Open Science by region in the global consultation on Open Science, (UNESCO, 2020b)	14
Figure 3	World population trends, PIB y GBID, 2007-2013. (UNESCO, 2015)	20
Figure 4	Distribution of researchers: total, percentage and per million inhabitants, 2007-2013. (UNESCO, 2015)	21
Figure 5	Distribution of scientific publications in the world, 2008 y 2014. (UNESCO, 2015)	21
Figure 6	Patents filed with the United States Patent and Trademark Office (USPTO), 2008 y 2013. (UNESCO, 2015)	22
Figure 7	Percentage distribution of GDP, GBID, researchers and publications of the G20 countries, 2009 y 2013. UNESCO, 2015	22
Figure 8	Internet users per 100 inhabitants, 2008 y 2013. (UNESCO, 2015)	23
Figure 9	Open Access policies and mandates from around the world registered in ROARMAP, 2005-2021. ROARMAP, 2021	29
Figure 10	Origin and type of Open Access policies from around the world registered in ROARMAP, 2005-2021. (ROARMAP, 2021)	30

- 
- Figure 11 Regional distribution of journals, documents and citations in Scopus. (Aguado-López, De la esperanza al fracaso. La privatización del acceso abierto a veinte años de las 3 B [From Hope to Failure. The Privatization of Open Access Twenty Years from the 3 B], 2021) 40
- Figure 12 Regional distribution of scientific production in Scopus. (Aguado-López, 2021) 41

## A first proposal for an Open Access policy in Angola

### Towards an Open Access, Open Science and Artificial Intelligence path in Angola: opening and integrating step by step

#### Warning

This document, and the set of ideas presented, responds to one of the objectives set out in the Collaboration Agreement between UNESCO and the Sistema de Información Científica Redalyc de la Universidad Autónoma del Estado de México (UAEMex) [Redalyc Scientific Information System of the Autonomous University of the State of Mexico (UAEMex)]: the creation of a roadmap for the development and adoption of an Open Access policy in Angola. The authors have experience in the field of scientific communication and Open Access, derived from their academic activity and political ties. The authors participated in the drafting of the Open Access Law (DEGREE by which various provisions of the Ley de Ciencia y Tecnología, de la Ley General de Educación y de la Ley Orgánica del Consejo Nacional de Ciencia y Tecnología, 2014 [Science and Technology Law, the General Education Law and the Organic Law of the National Council of Science and Technology] are amended and added) from Mexico; on the other part, as an academic research group on science communication (Cuerpo Académico “Difusión y Divulgación de la Ciencia” [Academic Body "Diffusion and Disclosure of Science"], UAEMex) they have been working for two decades on Open Access and Open Science, and are founders of Redalyc (originated in 2002) and AmeliCA (originated in 2019). They are also a founding member of the first network of

---

institutional repositories in Mexico (REMEDI, originated in 2012) and participated in various actions to promote Open Access at the Universidad Autónoma del Estado de México (Autonomous University of the State of Mexico).

To present a proposal to formulate and conduct an Open Access policy from Mexico to Angola -a country that acquired its independence on November 11th, 1975 and which democracy dates back to 1992-, can be considered in the least audacious sense and can only be undertaken from the horizon of ignorance of the other, the one which needs to be talked about. There could be an interest in the proposal that is made from the conjugation of two elements: the absence of knowledge about Angola -beyond the “demoscopic” studies and the “focus groups”- and the characteristics of the horizon of meaning of the present document and, in general, of the project "Acesso Aberto Angola": the will of more than 30 million human beings, the possibility of building the future of a society with a great history and with whom Mexico shares a historical past crossed by colonization and inequality, but also because of ancestral cultural diversity and the resilience of their societies.

In these elements lies all the potential and capacity to build the future as collective action: it can be “everything” or “nothing”, the dichotomous vision in which the so-called “modernity” has been built. For this reason, the proposed strategy uses a guiding, essential, constitutive principle of Western modernity born in the Enlightenment: Law. It starts from the understanding of it not in the legal sense, of norm and conduct, of forced action, but in the sense of possibility, of building a society that is based on Human Rights and Social Rights, so that they give it sense of the actions of public institutions and the backbone of the guidelines: the political nature of the budget and spending.

The final reflection -beyond questions of tactics and strategy where the instruments of technology, formal documents, academic publications; as well as cultural, scientific, public policy digital objects, etc.- is that the action, time, budget, orientation, debate, institutionality and the creation of spaces must be based on the construction of Human Rights and, within them, the right of access to knowledge generated with public resources as a common good of the society, of which the one that finances it can make an unrestricted use of. For this reason, the present and future policy must be based on the diversity of society's rights and the adaptation of the institutions in the search to promote, for the Angolan society, the Open Access, the Open Science, the Open Data and the artificial intelligence; axes that will allow the construction of a society that strives, works, builds, votes and distributes resources towards the constitution of a more equitable and inclusive society, in which everyone has access, in one way or another, to the benefits of Science and Knowledge: tributes of Humanity to itself.

## **Introduction and motives**

### ***UNESCO and knowledge societies as a Human Right***

UNESCO's mission is clear: to promote the conservation and advancement of knowledge; from various strategies, it promotes “knowledge societies” (UNESCO, 2021a). To do this, it promotes global access to knowledge and information, making use of the advantages of Information and Communication Technologies.

There is no possibility of arriving at knowledge societies with a one-dimensional vision of the language of communication, but a global conversation about science can only be realized when the scientific and academic communities read, write and enrich the contributions in their own language. Inclusiveness and recognition of diversity require various factors such as multilingualism, recognition of the right of researchers and society to access knowledge, preservation of memory and heritage. Based on this, UNESCO promotes the development of national policies on Open Access, Open Science and Artificial Intelligence (OA-OS-AI).

The OA-OS-AI triad constitutes the backbone of UNESCO. Only with universal access to knowledge and information is it possible to move towards more inclusive and equitable societies that articulate knowledge and science to the focused needs of societies. In this regard, UNESCO raises two global priorities, Africa and gender equality, although it promotes all those policies that allow the development of knowledge societies in the Member States, from the recognition that “the attacks to cultural diversity, the new forms of intolerance, the rejection of scientific facts and threats to freedom of expression put peace and Human Rights at risk. UNESCO's duty is to reaffirm the humanist missions of education, science and culture” (UNESCO, 2021b).

### ***Science as law in the main universal declarations***

In 2017, UNESCO issued the “Recommendation on Science and Scientific Researchers”, where, based on the consideration of science as a common good, it recommends



“(…) ensure fair and free access to scientific literature, data and content; as well as to remove obstacles to the publication, exchange and archiving of scientific results (…) (UNESCO, 2017).

In turn, as a principle for the international scope of scientific research, it recommends establishing actions that lead to

“equal access to science and the knowledge derived from it, not only as a social and ethical requirement for human development, but also as an essential condition to fully realize the potential of scientific communities around the world” (UNESCO, 2017).

Meanwhile, around scientific publication it establishes that

“Member States should encourage and facilitate the publication of the results obtained by scientific researchers and extend this practice to the data, methods and computer programs used, in order to help them share scientific information and acquire the reputation they deserve, as well as to promote science, education and culture in general.

In order to promote science as a public good, States should encourage and facilitate access to knowledge, in particular to Open Access” (UNESCO, 2017).

A second instrument that indicates science as a Human Right, with regard to its access and enjoyment of its benefits, is the “Universal Declaration of Human Rights” (1948), which establishes in its 27th article that every person has the right to “(…) participate in scientific progress and in the benefits that result from it (…)” (UN, 1948), as well as to “the protection of the moral and material interests that

correspond to it by reason for the scientific literary or artistic productions of which she is the author” (UN, 1966).

At the global level, this consideration is ratified and reinforced in the International Covenant on Economic, Social and Cultural Rights in its 15th article (UN, 1966). And in the inter-American sphere, in the American Declaration of the Rights and Duties of Man in its 13th article (Organization of American States, 1988) and in the Protocol of San Salvador on Economic, Social and Cultural Rights (Organization of American States, 1988 ), instruments that address scientific progress and technological progress.

Regarding the approach to science as a Human Right, (Saba, 2020) proposes that UNESCO has not deprioritized it unlike other rights at a global and regional level, but that it is a “forgotten right”. To support his point, Saba turns to William Schabas, who, taking up Hersch Lauterpacht, establishes

“that if economic, social and cultural rights are in a marginal area of the international human rights law, then the issue of the right to enjoy the benefits of scientific and technological progress and its applications is on the margins of economic, social and cultural rights”.

Likewise, Saba takes up Mikel Mancisidor, who affirms that

“The right to science belongs to the group of cultural rights. It has often been said that economic, social and cultural rights (ESCR) are, due to their lesser development, the poor brothers of the family of human rights. And within ESCR, cultural rights are the least elaborated and protected. We could go one step further and place the right to science behind, in turn, cultural rights ”.

“The right to science belongs to the group of cultural rights. It has often been said that economic, social and cultural rights (ESCR) are, due to their lesser development, the poor brothers of the family of human rights. And within ESCR, cultural rights are the least elaborated and protected. We could go one step further and place the right to science behind, in turn, cultural rights”.

Saba concludes that it is necessary to deepen the construction of the right to science, recognized by the Universal Declaration of Human Rights, but that "it has been relatively forgotten" (Saba, 2020), being that the importance of guaranteeing the right to benefits of science implies:

- Its practice is a condition for the execution of other rights (health, education, a dignified life). It is an “instrumental right for the exercise of other rights”. The field of health exemplifies this instrumental character well.
- Scientific progress, its benefits and applications are necessary to ensure sustainable development. The right to participate in the benefits can be interpreted as “a necessary condition to achieve development”.
- Science must be part of an essential development policy, since “the difficulty or impossibility of exercising this right contributes to making it more difficult or impossible to eradicate poverty and promote prosperity and well-being for all”.
- Progress in the scientific field does not have a specific scope, but is "both a national and a global phenomenon, and both dimensions result in different obligations for the States" (Saba, 2020).

- As the Declaration on Science and the Use of Scientific Knowledge at the World Conference on Science (1999) points out, there is a fundamental link between science and progress:

“Today more than ever, science and its applications are essential for development. Through appropriate education and research programs, the authorities -whatever their field of competence- and the private sector should provide more support to the construction of an adequate scientific and technological capacity and distributed in an equitable way, an indispensable foundation of a rational economic, social, cultural and environmental development (...)” (Declaration on science and the use of scientific knowledge, (1999).

### ***UNESCO and Open Science Recommendations***

At the 40th session of the General Conference of UNESCO<sup>1</sup>, 193 Member States entrusted the Organization with the development of an international standard-setting instrument on open science based on the “UNESCO Recommendation on Open Science” to be adopted by Member States in 2021. It is expected that the Recommendation will define shared values and principles for Open Science, and identify concrete measures on Open Access and Open Data, with specific proposals to bring citizens closer to science and commitments to facilitate the production and dissemination of scientific knowledge throughout the

---

<sup>1</sup> As a result, in 2019 a preliminary study of technical, financial and legal aspects was presented regarding the convenience of having an Open Science recommendation. See at [https://unesdoc.unesco.org/ark:/48223/pf0000370291\\_spa](https://unesdoc.unesco.org/ark:/48223/pf0000370291_spa)

world. The UNESCO Recommendation on Open Science will complement the 2017 Recommendation on science and scientific research. It will also build on the UNESCO Strategy on Open Access to Scientific Information and Research and the new UNESCO Recommendation on Open Educational Resources.

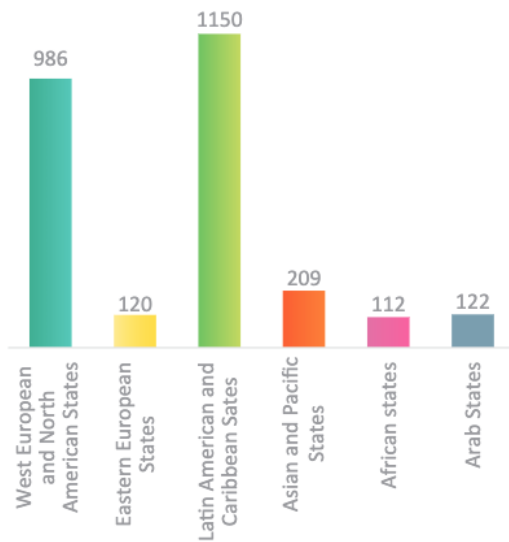
It is important to recall that the UNESCO Recommendations are legal instruments in which the General Conference formulates principles and norms of international regulation on the matters in question, and accordingly invites the Member States to establish or adapt legislative or regulatory -or of any other nature- measures that are necessary for the achievement of the agreed axes and in harmony with the constitutional practice of each State. Recommendations emanate from the supreme governing body of the Organization and are therefore highly authoritative as they are intended to influence the development of national laws and practices.

The idea behind Open Science is to allow scientific information, “data and products to be more accessible (open access) and used more reliably (open data) with the active participation of all interested parties (open to society)” (UNESCO, 2020a). In the words of Beigel (2021a), “the open science movement has emerged from the scientific community and has spread rapidly through the nations, calling for the opening of the doors of knowledge”. A diversity of stakeholders such as investors, political leaders and citizens, have joined this call. However, given the fragmentation of the political and scientific contexts, the absence of a global understanding of what Open Science means, as well as the opportunities and challenges that it implies, stands out.



**Results of the Global Consultation on Open Science**

From February to July 2020, UNESCO carried out a global Consultation on Open Science, which summoned 2,900 participants, including international and regional entities, and numerous stakeholders linked to the field; 133 countries also made contributions. In this regard, it highlights that, although various respondents saw Open Science as a way to eliminate technological and financial barriers to science, particularly in the Global South, they highlighted the need for a clear definition of values and common principles of Open Science as prerequisites for establishing a global consensus around it. Below are some central aspects of the global consultation on Open Science (UNESCO, 2020b); it highlights that although Africa represents around 15% of the world's population, the region's participation in the global consultation on Open Science amounts to 4.1%.



UNESCO electoral group	Number of countries from which respondents provided input into the survey
West European and North American States (Group I)	21 out of 26 countries
Eastern European States (Group II)	22 out of 25 countries
Latin American and Caribbean States (Group III)	25 out of 33 countries
Asian and Pacific States (Group IV)	28 out of 44 countries
African States (Group V (a))	28 out of 47 countries
Arab States (Group V (b))	17 out of 19 countries

West Europe and North America	Eastern Europe	Latin America and the Caribbean	Asia-Pacific	Africa	Arab States
France 275	Romania 30	Argentina 308	India 40	Nigeria 20	Bahrain 42
Germany 103	Slovenia 25	Peru 267	China 25	South Africa 18	Palestine 30
USA 84	Hungary 9	Ecuador 164	Pakistan 21	Kenya 11	Tunisia 8
Spain 78	North Macedonia 7	Brazil 161	Australia 19	Ghana 10	Egypt 7
UK 78	Armenia 5	Colombia 66	Indonesia 12	Senegal 6	Lebanon 7
Switzerland 73	Czechia 5	Mexico 46	New Zealand 12	Zimbabwe 6	Oman 7
Netherlands 72	Latvia 5	Uruguay 35	Sri Lanka 11	Cameroon 5	Syrian Arab 4
Canada 65	Serbia 5	Chile 5	Afghanistan 25	Benin 9	Algeria 3
Belgium 26	Ukraine 4	Venezuela 4	Japan 25	Madagascar 8	Arab 3
Finland 25	Albania 3	Bolivia 3	Malaysia 11	Côte d'Ivoire 8	Jordan 4
Italy 25	Belarus 3	Costa Rica 3	Republic of Korea 9	Uganda 7	Morocco 2
Austria 15	Bulgaria 3	Panama 3	Philippines 8	Botswana 5	Iraq 2
Sweden 14	Croatia 3	Dominican Republic 3	Viet Nam 4	Ethiopia 5	Israel 1
Portugal 11	Uzbekistan 3	Haiti 3	Bangladesh 4	Gabon 3	Libya 2
Ireland 10	Estonia 2	Cuba 2	Nepal 3	Mozambique 3	United Arab 1
Norway 9	Lithuania 2	Bahamas 2	Samoa 2	Republic of Congo 3	Saudi Arab 1
Greece 8	Russian Federation 2	El Salvador 2	Singapore 2	Angola 3	Sudan 1
Turkey 8	Azerbaijan 1	Guatemala 1	Thailand 2	Burkina Faso 3	1
Denmark 3	Georgia 3	Paraguay 1	Mongolia 2	Cabo Verde 2	1
Luxembourg 2	Poland 2	Aruba 1	Nepal 1	Republic of the Congo 2	1
Andorra 1	Slovakia 1	Barbados 1	Fiji 1	Eswatini 1	1
Malta 1		Honduras 1	Iran 1	Guinea 1	1
		Jamaica 1	Kazakhstan 1	Mauritius 1	1
		Puerto Rico 1	Maldives 1	Namibia 1	1
		Trinidad and Tobago 1	Micronesia 1	Niger 1	1
			Myanmar 1	Togo 1	1
			Niue 1		
			Democratic People's Republic of Korea 1		

Figure 1 Geographic distribution of countries and regions participating in the global consultation on Open Science, (UNESCO, 2020b)

On the other hand, although there is much a greater association between production and investment and participation, it is important to highlight that it is the countries of the global South that are most affected by the distortions that implies the market being the entity that takes over the decision-making and the academic publishing trends.

Participation and the way in which various aspects of Open Science are prioritized is of relevance when said assessment is carried out regionally. The three most important dimensions of Open Science for the participants from Africa who participated in the Consultation are: 1. Open Access to scientific journals, where they agree with the assessment of all respondents; 2. The Open Access to educational resources (RAE) stands out in second place, and 3. Scientific dissemination. It highlights that for the African community the establishment of

links with indigenous and local knowledge is also relevant, when this aspect was valued only in 10th place globally.

Which of the following aspects are relevant to Open Science?	Total	Western European and North American States	Eastern European States	Latin American and Caribbean States	Asian and Pacific States	African States	Arab States
Open access to scientific journals	568	214	27	243	38	24	23
Open access to data	508	206	25	202	35	20	19
Open access to educational resources	499	171	25	219	38	23	22
Science outreach and communication	490	160	21	235	35	21	18
Open source	443	179	20	170	35	20	19
Open collaborations	417	134	21	192	32	19	19
Open evaluation	351	126	17	154	26	16	12
Co-design of research projects	343	97	14	178	23	15	15
Citizen science	338	114	14	159	25	14	12
Links with indigenous and local knowledge	322	98	12	151	28	18	15
Open innovation	307	82	18	154	26	15	13
Open infrastructures (Open labs/Open Hardware)	283	96	18	117	23	15	13
Crowd sourcing	275	64	10	158	20	12	11
Open notebooks	227	82	13	93	17	11	11

Figure 2 Most relevant aspects of Open Science by region in the global consultation on Open Science, (UNESCO, 2020b)

In the Africa assessment of Open Science, the participants highlighted it as a way to improve the efficiency and productivity of research, as well as a way to maintain the reliability of society in science from the integration of various disciplines to address current problems and promote the participation of society as knowledge stakeholders to address shared problems. Likewise, sustainable investment in strong science, technology and innovation systems across the continent, including investment in Open Science infrastructure and capabilities, were highlighted as key aspects of Open Science (UNESCO, 2020b).

Despite the early mentioned, in the Consultation, only 8 out of 10 participants from Africa reported knowing Open Access, or that there is an institution dedicated to it in that region. In turn, regarding policies or strategies towards Open Science, more than 9 out of 10 participants responded that they did not know of any initiative in

this regard. For their part, among the efforts that were referred to around the promotion of Open Science practices, they mentioned Open Science platforms, repositories and networks with provisions for collaboration in research, data and laboratories promoted by universities and scientific associations. Among the initiatives mentioned the Africa Open Science & Hardware, the African Open Science Platform and the African repository ArXiv stand out, within ten African principles for Open Access in academic communication are presented (UNESCO, 2020b)

### ***Open Science Recommendation, November 2021***

The UNESCO General Conference, at its 41st session in Paris, France, between November 9th and 24th, 2021, submitted the Recommendation on Open Science, dated September 8th (2021c), under the Member States approval. This undoubtedly represents an advance for the OA-OS-AI triad, which advances on the UNESCO Recommendation on Science and Scientific Researchers (2017), and which recognizes, among other aspects, the considerable value of science as a common good; at the same time, on the Recommendation on Open Educational Resources (2019) of UNESCO and the Universal Convention on Copyright (1971) of UNESCO, and taking note of the Strategy on UNESCO's contribution to the promotion of free access to scientific information and research and to the Charter on the preservation of digital heritage (2009), approved by the General Conference of UNESCO at its 36th and 32nd meetings, respectively.

Recognizing, furthermore, among the multiple antecedents of Open Science the Declaration on science and the use of scientific knowledge within the framework of the World Conference on Science (UNESCO, 1999) and the General Framework

of Action of the Program in Pro of the UNESCO Science (1999), as well as a series of central instruments in Open Access, conformed by the Budapest Initiative for Open Access (2002), the Bethesda Declaration on Open Access Publishing (2003) and the Declaration of Berlin on Open Access to Knowledge in Sciences and Humanities (2003), the Open Science Recommendation was approved on November 23th, 2021. It sets out a common definition, as well as shared values, principles and norms for Open Science to global scale, and a set of measures is proposed to promote a fair and equitable implementation of Open Science for all people at the individual, institutional, national, regional and international levels.

The main objectives and scopes of action of the UNESCO Open Science Recommendation (2021c) are:

1. Promote a common definition of Open Science, the benefits and challenges that it entails, and its various routes of access.
2. Create an ideal regulatory environment for Open Science.
3. Invest in Open Science infrastructures and services.
4. Invest in human resources, training, education, digital literacy and skill building for Open Science.
5. Promote a culture of Open Science and harmonize incentives in favor of it.
6. Promote innovative approaches to Open Science in the different stages of the scientific process.
7. Promote international and multi-stakeholder cooperation in the context of Open Science and with the goal of reducing digital, technological and knowledge gaps.



---

To give greater precision to the objectives and areas of action, it is important to emphasize the definition of Open Science to which the Recommendation refers:

“(...) open science is defined as an inclusive construct that combines diverse movements and practices in order to make multilingual scientific knowledge openly available and accessible to all, as well as reusable by all, increasing scientific collaborations and the exchange of information for the benefit of science and society, and the processes of creation, evaluation and communication of scientific knowledge are opened to social agents beyond the traditional scientific community (...)” (UNESCO, 2021c).

And it is based on the following key axes: open scientific knowledge, open science infrastructures, scientific communication, open participation of social agents and open dialogue with other knowledge systems.

In turn, the Recommendation defines open scientific knowledge as:

“Open scientific knowledge refers to open access to scientific publications, research data, metadata, open educational resources, computer programs and source codes and computer equipment that are available in the public domain or protected by copyright and are subject to an open license that allows access to them, as well as their reuse, conversion, adaptation and distribution under specific conditions, and which have been provided to all agents immediately or as quickly as possible (...) and free of charge”

A central aspect of the UNESCO Open Science Recommendation is that it moves towards a non-commercial Open Science proposal. Therefore it clearly manifests:

1. “A paid publishing method, in which immediate access to scientific publications is only granted in exchange for a payment, does not conform to this Recommendation. Any transfer or license of copyright to third parties should not restrict the public's right to immediate open access to a scientific publication”;
2. An abundance of: “Access to scientific knowledge should be as open as possible. Access restrictions must be proportionate and justified, and can only be justified for reasons of protection of human rights, national security, confidentiality, right to privacy and respect for human study subjects, legal process and public order and protection of intellectual property rights, personal data, sacred and secret indigenous knowledge and rare, threatened or endangered species”;
3. A search should be made for “(...) appropriate regulations to avoid dependence on the provider, predatory behavior and the abusive or unfair capture of the benefits of scientific activities financed with public funds (...) Member States should ensure that the market for services related to science and open science functions in the public interest and worldwide and without any commercial entity exercising a dominant position”;
4. And support “(...) non-commercial publishing models and collaborative publishing models that do not imply charges for processing articles or books”.

Those responsible for the preparation of this roadmap for the development and adoption of an Open Access policy in Angola, as promoters of Open Access and Open Science in a trajectory of around 20 years, express with full conviction that the objectives of the OA-OS-AI triad could not be achieved without a change in

---

the current evaluation parameters. Therefore, they welcome the clarity with which the UNESCO Open Science Recommendation expresses such directionality:

1. "(...) assessment systems should take into account the wide range of missions that make up the knowledge creation environment. These missions involve different forms of knowledge creation and communication that are not limited to publication in international peer-reviewed journals".
2. "They are inspired by existing initiatives to improve ways of evaluating scientific results, such as the San Francisco Declaration on Research Evaluation (2012)."
3. "Attach importance to all research activities and all relevant scientific results, in particular data and metadata of high quality and consistent with FAIR principles."
4. "Take into account the evidence of the impact of research and knowledge sharing (...) the diversity of disciplines."
5. "The evaluation of researchers with respect to the criteria of open science should be adapted to the different stages of their careers, paying special attention to researchers who are at the beginning of their career."
6. "Ensure that the practice of open science is known and is taken into account as a criterion for recruitment and academic and scientific promotion."
7. "Encourage funders, research institutions, journal editorial boards, scientific societies, and publishers to adopt policies that require and reward open access."

8. “Ensure the diversity of academic communications (...)”

The foregoing is particularly relevant for the global South, specifically, for regions such as Africa, given its characterization in academic-scientific terms as shown in the following sections.

*Africa in the global context: some data from the UNESCO Science Report, towards 2030*

	Población (en millones)		Proporción de la población mundial (%)		PIB en miles de millones de dólares estadounidenses en PPA constantes 2005				Proporción del PIB mundial (%)			
	2007	2013	2007	2013	2007	2009	2011	2013	2007	2009	2011	2013
<b>Mundo</b>	<b>6 673,1</b>	<b>7 162,1</b>	<b>100,0</b>	<b>100,0</b>	<b>72 198,1</b>	<b>74 176,0</b>	<b>81 166,9</b>	<b>86 674,3</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>
Economías de ingresos altos	1 264,1	1 309,2	18,9	18,3	41 684,3	40 622,2	42 868,1	44 234,6	57,7	54,8	52,8	51,0
Economías de ingresos medianos altos	2 322,0	2 442,1	34,8	34,1	19 929,7	21 904,3	25 098,5	27 792,6	27,6	29,5	30,9	32,1
Economías de ingresos medianos bajos	2 340,7	2 560,4	35,1	35,7	9 564,7	10 524,5	11 926,1	13 206,4	13,2	14,2	14,7	15,2
Economías de bajos ingresos	746,3	850,3	11,2	11,9	1 019,4	1 125,0	1 274,2	1 440,7	1,4	1,5	1,6	1,7
<b>América</b>	<b>913,0</b>	<b>971,9</b>	<b>13,7</b>	<b>13,6</b>	<b>21 381,6</b>	<b>21 110,0</b>	<b>22 416,8</b>	<b>23 501,5</b>	<b>29,6</b>	<b>28,5</b>	<b>27,6</b>	<b>27,1</b>
América del Norte	336,8	355,3	5,0	5,0	14 901,4	14 464,1	15 088,7	15 770,5	20,6	19,5	18,6	18,2
América Latina	535,4	574,1	8,0	8,0	6 011,0	6 170,4	6 838,5	7 224,7	8,3	8,3	8,4	8,3
Caribe	40,8	42,5	0,6	0,6	468,2	475,5	489,6	506,3	0,6	0,6	0,6	0,6
<b>Europa</b>	<b>806,5</b>	<b>818,6</b>	<b>12,1</b>	<b>11,4</b>	<b>18 747,3</b>	<b>18 075,1</b>	<b>19 024,5</b>	<b>19 177,9</b>	<b>26,0</b>	<b>24,4</b>	<b>23,4</b>	<b>22,1</b>
Unión Europea	508,8	509,5	7,5	7,1	14 706,7	14 156,7	14 703,8	14 659,5	20,4	19,1	18,1	16,9
Europa Sudoriental	19,6	19,2	0,3	0,3	145,7	151,0	155,9	158,8	0,2	0,2	0,2	0,2
Asociación Europea de Libre Comercio	12,6	13,5	0,2	0,2	558,8	555,0	574,3	593,2	0,8	0,7	0,7	0,7
Resto de Europa	273,6	276,4	4,1	3,9	3 342,0	3 212,3	3 590,5	3 766,4	4,6	4,3	4,4	4,3
<b>África</b>	<b>957,3</b>	<b>1 116,6</b>	<b>14,3</b>	<b>15,5</b>	<b>3 555,7</b>	<b>3 861,4</b>	<b>4 109,8</b>	<b>4 458,4</b>	<b>4,9</b>	<b>5,2</b>	<b>5,1</b>	<b>5,1</b>
África Subsahariana	764,7	897,3	11,5	12,5	2 020,0	2 194,3	2 441,8	2 678,5	2,8	3,0	3,0	3,1
Estados árabes de África	192,6	213,3	2,9	3,0	1 535,8	1 667,1	1 668,0	1 779,9	2,1	2,2	2,1	2,1
<b>Asia</b>	<b>3 961,5</b>	<b>4 222,6</b>	<b>59,4</b>	<b>59,0</b>	<b>27 672,8</b>	<b>30 248,0</b>	<b>34 695,7</b>	<b>38 558,5</b>	<b>38,3</b>	<b>40,8</b>	<b>42,7</b>	<b>44,5</b>
Asia Central	61,8	67,2	0,9	0,9	408,9	446,5	521,2	595,4	0,6	0,6	0,6	0,7
Estados árabes de Asia	122,0	145,2	1,8	2,0	2 450,0	2 664,0	3 005,2	3 308,3	3,4	3,6	3,7	3,8
Asia Occidental	94,9	101,9	1,4	1,4	1 274,2	1 347,0	1 407,0	1 464,1	1,8	1,8	1,8	1,7
Asia Meridional	1 543,1	1 671,6	23,1	23,3	5 016,1	5 599,2	6 476,8	7 251,4	6,9	7,5	8,0	8,4
Asia Sudoriental	2 139,7	2 236,8	32,1	31,2	18 523,6	20 191,3	23 225,4	25 939,3	25,7	27,2	28,6	29,9
<b>Oceania</b>	<b>34,8</b>	<b>38,3</b>	<b>0,5</b>	<b>0,5</b>	<b>840,7</b>	<b>881,5</b>	<b>920,2</b>	<b>978,0</b>	<b>1,2</b>	<b>1,2</b>	<b>1,1</b>	<b>1,1</b>

	GBID (en miles de millones de dólares estadounidenses en PPA)				Porcentaje del GBID mundial (%)			
	2007	2009	2011	2013	2007	2009	2011	2013
<b>Mundo</b>	<b>1 132,3</b>	<b>1 225,5</b>	<b>1 340,2</b>	<b>1 477,7</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>
Economías de ingresos altos	902,4	926,7	972,8	1 024,0	79,7	75,6	72,6	69,3
Economías de ingresos medianos altos	181,8	243,9	303,9	381,8	16,1	19,9	22,7	25,8
Economías de ingresos medianos bajos	46,2	52,5	60,2	68,0	4,1	4,3	4,5	4,6
Economías de bajos ingresos	1,9	2,5	3,2	3,9	0,2	0,2	0,2	0,3
<b>América</b>	<b>419,8</b>	<b>438,3</b>	<b>451,6</b>	<b>478,8</b>	<b>37,1</b>	<b>35,8</b>	<b>33,7</b>	<b>32,4</b>
América del Norte	382,7	396,5	404,8	427,0	33,8	32,4	30,2	28,9
América Latina	35,5	38,8	45,6	50,1	3,1	3,3	3,4	3,4
Caribe	1,6	2,0	1,3	1,7	0,1	0,2	0,1	0,1
<b>Europa</b>	<b>297,1</b>	<b>311,6</b>	<b>327,5</b>	<b>335,7</b>	<b>26,2</b>	<b>25,4</b>	<b>24,4</b>	<b>22,7</b>
Unión Europea	251,3	262,8	278,0	282,0	22,2	21,4	20,7	19,1
Europa Sudoriental	0,5	0,8	0,7	0,8	0,0	0,1	0,1	0,1
Asociación Europea de Libre Comercio	12,6	13,1	13,7	14,5	1,1	1,1	1,0	1,0
Resto de Europa	32,7	34,8	35,0	38,5	2,9	2,8	2,6	2,6
<b>África</b>	<b>12,9</b>	<b>15,5</b>	<b>17,1</b>	<b>19,9</b>	<b>1,1</b>	<b>1,3</b>	<b>1,3</b>	<b>1,3</b>
África Subsahariana	8,4	9,2	10,0	11,1	0,7	0,7	0,7	0,8
Estados árabes de África	4,5	6,4	7,1	8,8	0,4	0,5	0,5	0,6
<b>Asia</b>	<b>384,9</b>	<b>480,7</b>	<b>524,8</b>	<b>622,9</b>	<b>34,0</b>	<b>39,2</b>	<b>39,2</b>	<b>42,2</b>
Asia Central	0,8	1,1	1,0	1,4	0,1	0,1	0,1	0,1
Estados árabes de Asia	4,3	5,0	5,6	6,7	0,4	0,4	0,4	0,5
Asia Occidental	15,5	16,1	17,5	18,1	1,4	1,3	1,3	1,2
Asia Meridional	35,4	38,6	45,7	50,9	3,1	3,2	3,4	3,4
Asia Sudoriental	328,8	378,8	455,1	545,8	29,0	30,9	34,0	36,9
Oceanía	17,6	19,4	19,1	20,3	1,6	1,6	1,4	1,4

Figure 3 World population trends, PIB y GBID, 2007-2013. (UNESCO, 2015)

	Investigadores (milés)				Porcentaje de investigadores en el mundo (%)				Investigadores por millón de habitantes			
	2007	2009	2011	2013	2007	2009	2011	2013	2007	2009	2011	2013
<b>Mundo</b>	<b>6 400,9</b>	<b>6 961,9</b>	<b>7 350,4</b>	<b>7 758,9</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>959,2</b>	<b>1 099,8</b>	<b>1 050,4</b>	<b>1 083,3</b>
Economías de ingresos altos	4 445,9	4 653,9	4 823,1	4 993,6	69,5	67,4	65,6	64,4	3 517,0	3 632,3	3 720,4	3 814,1
Economías de ingresos medianos altos	1 441,8	1 709,4	1 952,3	2 168,8	22,5	24,8	26,6	28,0	620,9	723,9	813,0	888,1
Economías de ingresos medianos bajos	438,6	453,2	478,0	493,8	6,9	6,6	6,5	6,4	187,8	187,8	192,2	192,9
Economías de bajos ingresos	73,6	85,4	96,9	102,6	1,2	1,2	1,3	1,3	98,7	109,6	119,1	120,7
<b>América</b>	<b>1 516,6</b>	<b>1 656,7</b>	<b>1 696,1</b>	<b>1 721,9</b>	<b>23,7</b>	<b>24,0</b>	<b>23,1</b>	<b>22,2</b>	<b>1 661,2</b>	<b>1 776,1</b>	<b>1 780,8</b>	<b>1 771,6</b>
América del Norte	1 384,9	1 401,2	1 416,1	1 433,3	20,1	20,3	19,3	18,5	3 814,6	4 061,5	4 052,0	4 034,1
América Latina	222,6	245,7	279,8	288,0	3,5	3,6	3,7	3,6	415,8	448,3	482,7	487,7
Caribe	9,1	9,7	9,2	8,5	0,1	0,1	0,1	0,1	223,0	235,4	220,2	200,8
<b>Europa</b>	<b>2 125,6</b>	<b>2 285,0</b>	<b>2 296,8</b>	<b>2 488,1</b>	<b>33,2</b>	<b>31,9</b>	<b>31,2</b>	<b>31,0</b>	<b>2 635,4</b>	<b>2 717,4</b>	<b>2 816,4</b>	<b>2 941,9</b>
Unión Europea	1 458,1	1 594,0	1 623,9	1 726,3	22,8	22,5	22,1	22,2	2 911,8	3 081,9	3 202,0	3 388,3
Europa Sudoriental	11,3	12,8	14,2	14,9	0,2	0,2	0,2	0,2	575,4	659,9	734,8	772,0
Asociación Europea de Libre Comercio	51,9	56,8	62,9	67,2	0,8	0,8	0,9	0,9	4 112,4	4 380,4	4 757,0	4 980,8
Resto de Europa	604,3	601,4	595,8	599,0	9,4	9,4	9,1	9,7	2 208,8	2 115,3	2 160,2	2 170,4
<b>África</b>	<b>150,1</b>	<b>152,7</b>	<b>173,4</b>	<b>187,5</b>	<b>2,3</b>	<b>2,2</b>	<b>2,4</b>	<b>2,4</b>	<b>156,8</b>	<b>151,8</b>	<b>164,1</b>	<b>168,8</b>
África Subsahariana	58,8	69,4	77,1	82,0	0,9	1,0	1,0	1,1	77,0	86,0	90,6	91,4
Estados árabes de África	91,3	83,3	96,3	105,5	1,4	1,2	1,3	1,4	474,0	418,1	467,2	494,5
<b>Asia</b>	<b>2 096,1</b>	<b>2 770,8</b>	<b>3 065,9</b>	<b>3 318,0</b>	<b>32,0</b>	<b>40,1</b>	<b>41,7</b>	<b>42,8</b>	<b>806,9</b>	<b>894,4</b>	<b>740,9</b>	<b>745,8</b>
Asia Central	21,7	25,1	26,1	33,6	0,3	0,4	0,4	0,4	351,6	395,0	399,7	500,0
Estados árabes de Asia	31,6	35,6	40,7	44,0	0,5	0,5	0,6	0,6	259,2	272,5	294,4	303,1
Asia Occidental	116,2	119,2	124,3	136,9	1,8	1,7	1,7	1,8	1 224,1	1 226,9	1 249,1	1 343,2
Asia Meridional	296,2	223,6	233,0	242,4	3,2	3,2	3,2	3,1	133,7	141,0	143,1	145,0
Asia Sudoriental	2 122,4	2 367,4	2 639,8	2 861,1	33,2	34,3	35,9	36,9	991,9	1 090,1	1 197,6	1 279,1
Oceanía	110,5	116,7	120,1	123,3	1,7	1,7	1,6	1,6	3 175,8	3 235,7	3 226,8	3 218,9

Figure 4 Distribution of researchers: total, percentage and per million inhabitants, 2007-2013. (UNESCO, 2015)



	Total publicaciones		Variación (%) 2008-2014	Porcentaje mundial de publicaciones (%)		Publicaciones por millón de habitantes		Publicaciones con coautores internacionales (%)	
	2008	2014		2008	2014	2008	2014	2008	2014
	<b>Mundo</b>	<b>1 029 471</b>	<b>1 270 425</b>	<b>23,4</b>	<b>100,0</b>	<b>100,0</b>	<b>153</b>	<b>176</b>	<b>20,9</b>
Economías de ingresos altos	812 863	908 960	11,8	79,0	71,5	653	707	26,0	33,8
Economías de ingresos medianos altos	212 814	413 779	94,4	20,7	32,6	91	168	28,0	28,4
Economías de ingresos medianos bajos	58 843	86 139	46,4	5,7	6,8	25	33	29,2	37,6
Economías de bajos ingresos	4 574	7 660	67,5	0,4	0,6	6	9	80,1	85,8
<b>América</b>	<b>369 414</b>	<b>417 372</b>	<b>13,0</b>	<b>35,9</b>	<b>32,9</b>	<b>403</b>	<b>428</b>	<b>29,7</b>	<b>38,2</b>
América del Norte	325 942	362 806	11,3	31,7	28,6	959	1 013	30,5	39,6
América Latina	50 182	65 239	30,0	4,9	5,1	93	112	34,5	41,1
Caribe	1 289	1 375	6,7	0,1	0,1	36	36	64,6	82,4
<b>Europa</b>	<b>438 450</b>	<b>498 817</b>	<b>13,8</b>	<b>42,6</b>	<b>39,3</b>	<b>542</b>	<b>609</b>	<b>34,8</b>	<b>42,1</b>
Unión Europea	379 154	432 195	14,0	36,8	34,0	754	847	37,7	45,5
Europa Sudoriental	3 314	5 505	66,1	0,3	0,4	170	287	37,7	43,3
Asociación Europea de Libre Comercio	26 958	35 559	31,9	2,6	2,8	2 110	2 611	62,5	70,1
Resto de Europa	51 485	57 208	11,1	5,0	4,5	188	207	27,2	30,3
<b>África</b>	<b>20 786</b>	<b>33 282</b>	<b>60,1</b>	<b>2,0</b>	<b>2,6</b>	<b>21</b>	<b>29</b>	<b>52,3</b>	<b>64,6</b>
África Subsahariana	11 933	18 014	51,0	1,2	1,4	15	20	57,4	68,7
Estados árabes de África	8 956	15 579	74,0	0,9	1,2	46	72	46,0	60,5
<b>Asia</b>	<b>292 230</b>	<b>501 798</b>	<b>71,7</b>	<b>28,4</b>	<b>39,5</b>	<b>73</b>	<b>118</b>	<b>23,7</b>	<b>26,1</b>
Asia Central	744	1 249	67,9	0,1	0,1	12	18	64,0	71,3
Estados árabes de Asia	5 842	17 461	198,9	0,6	1,4	46	118	50,3	76,8
Asia Occidental	22 981	37 946	65,1	2,2	3,0	239	368	33,0	33,3
Asia Meridional	41 646	62 468	50,0	4,0	4,9	27	37	21,2	27,8
Asia Sudoriental	224 875	395 897	76,1	21,8	31,2	105	178	23,7	25,2
<b>Oceanía</b>	<b>35 882</b>	<b>52 782</b>	<b>47,1</b>	<b>3,5</b>	<b>4,2</b>	<b>1 036</b>	<b>1 389</b>	<b>46,8</b>	<b>55,7</b>

Figure 5 Distribution of scientific publications in the world, 2008 y 2014. (UNESCO, 2015)

	Patentes de la USPTO			
	Total		Distribución porcentual mundial (%)	
	2008	2013	2008	2013
<b>Mundo</b>	<b>157 768</b>	<b>277 832</b>	<b>100,0</b>	<b>100,0</b>
Economías de ingresos altos	149 290	258 411	94,6	93,0
Economías de ingresos medianos altos	2 640	9 529	1,7	3,4
Economías de ingresos medianos bajos	973	3 586	0,6	1,3
Economías de bajos ingresos	15	59	0,0	0,0
<b>América</b>	<b>83 339</b>	<b>145 741</b>	<b>52,8</b>	<b>52,5</b>
América del Norte	83 097	145 114	52,7	52,2
América Latina	342	829	0,2	0,3
Caribe	21	61	0,0	0,0
<b>Europa</b>	<b>25 780</b>	<b>48 737</b>	<b>16,3</b>	<b>17,5</b>
Unión Europea	24 121	45 401	15,3	16,3
Europa Sudoriental	4	21	0,0	0,0
Asociación Europea de Libre Comercio	1 831	3 772	1,2	1,4
Resto de Europa	362	773	0,2	0,3
<b>África</b>	<b>137</b>	<b>303</b>	<b>0,1</b>	<b>0,1</b>
África Subsahariana	119	233	0,1	0,1
Estados árabes de África	18	70	0,0	0,0
<b>Asia</b>	<b>46 773</b>	<b>83 904</b>	<b>29,6</b>	<b>30,2</b>
Asia Central	3	8	0,0	0,0
Estados árabes de Asia	81	426	0,1	0,2
Asia Occidental	1 350	3 464	0,9	1,2
Asia Meridional	855	3 350	0,5	1,2
Asia Sudoriental	44 515	76 796	28,2	27,6
<b>Oceanía</b>	<b>1 565</b>	<b>2 245</b>	<b>1,0</b>	<b>0,8</b>

Figure 6 Patents filed with the United States Patent and Trademark Office (USPTO), 2008 y 2013. (UNESCO, 2015)



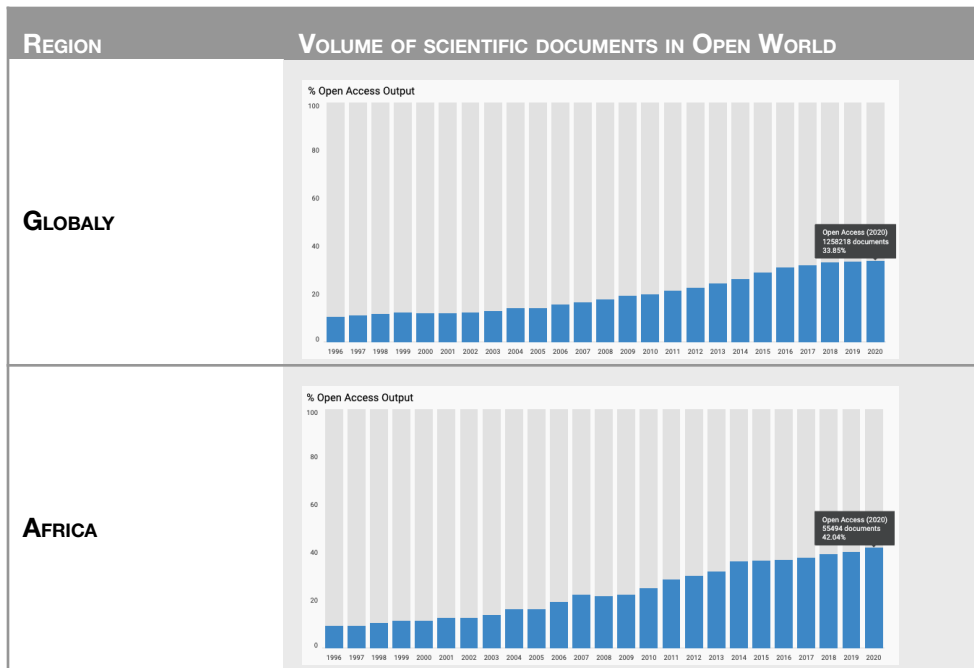
Figure 7 Percentage distribution of GDP, GBID, researchers and publications of the G20 countries, 2009 y 2013. UNESCO, 2015

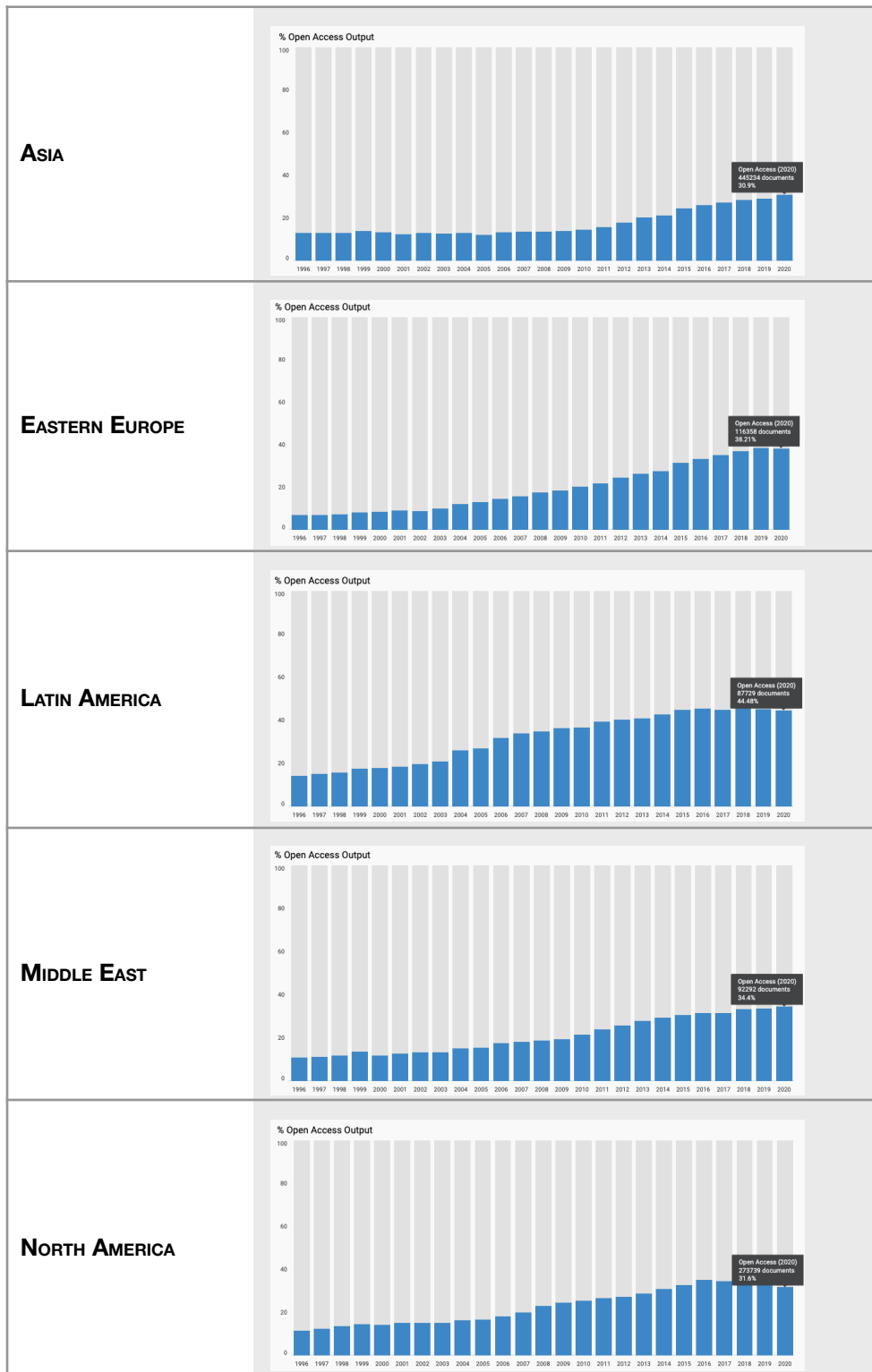
	2008	2014
Mundo	23,13	37,97
Economías de ingresos altos	64,22	78,20
Economías de ingresos medianos altos	23,27	44,80
Economías de ingresos medianos bajos	7,84	21,20
Economías de bajos ingresos	2,39	7,13
<b>América</b>	<b>44,15</b>	<b>60,45</b>
América del Norte	74,26	84,36
América Latina	27,09	47,59
Caribe	16,14	30,65
<b>Europa</b>	<b>50,82</b>	<b>67,95</b>
Unión Europea	64,19	75,50
Europa Sudoriental	34,55	57,42
Asociación Europea de Libre Comercio	83,71	90,08
Resto de Europa	25,90	53,67
<b>África</b>	<b>8,18</b>	<b>20,78</b>
África Subsahariana	5,88	16,71
Estados árabes de África	17,33	37,65
<b>Asia</b>	<b>15,99</b>	<b>31,18</b>
Asia Central	9,53	35,04
Estados árabes de Asia	19,38	38,59
Asia Occidental	14,37	37,84
Asia Meridional	4,42	13,74
Asia Sudoriental	24,63	43,58
Oceanía	54,50	64,38

Figure 8 Internet users per 100 inhabitants, 2008 y 2013. (UNESCO, 2015)

**Open Access and scientific production in the world, Africa and Angola: the perspective from Scopus**

The academic-scientific and technological performance of each region takes a different perspective if the proportion of open scientific production is observed. A brief characterization of Open Access from Scopus, based on data from the Scimago Journal Rank in 2021 (Scimago Lab, 2021), allows to highlight that the two regions with the highest volumes of Open Access documents (period 1996-2020) are Latin America (44.4%) and Africa (42%); a level of Open Access higher than the world average: 33.8% (see Table 1).





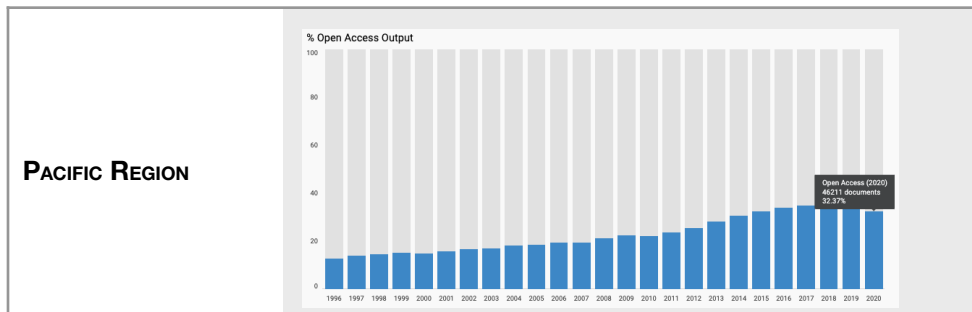


Table 1 Volume of open scientific documents, 1996-2020. SJR, Scopus, 2021

For its part, the analysis of the scientific production of Africa from Scopus, based on the SJR (one of the information universes that is specially considered in what has been defined as “mainstream”), allows us to identify that Angola is located in 37th place out of the 59 African countries that register scientific production in this database. It stands out that only 4 countries exceed 100,000 documents: South Africa, with 342,060; Egypt, with 264,543; Nigeria with 118,048 and Tunisia with 104,541.

In a second group, two countries with a volume of scientific production of between 100,000 and 50,000 documents can be located, identified from the SJR: Algeria and Morocco. For their part, nine countries have a volume of scientific production below 50,000, but above 10,000 documents: Kenya, Ethiopia, Ghana, Uganda, Tanzania, Cameroon, Zimbabwe, Senegal and Sudan. Together; these 15 countries contribute 90.8% of the scientific production of the 59 countries in Africa with scientific production identified from Scopus, SJR. In summary, 25.6% of the countries concentrate 90.8% of the scientific production registered in Scopus from 1996 to 2020; these same countries concentrate 94% of the citations (see Table 2).



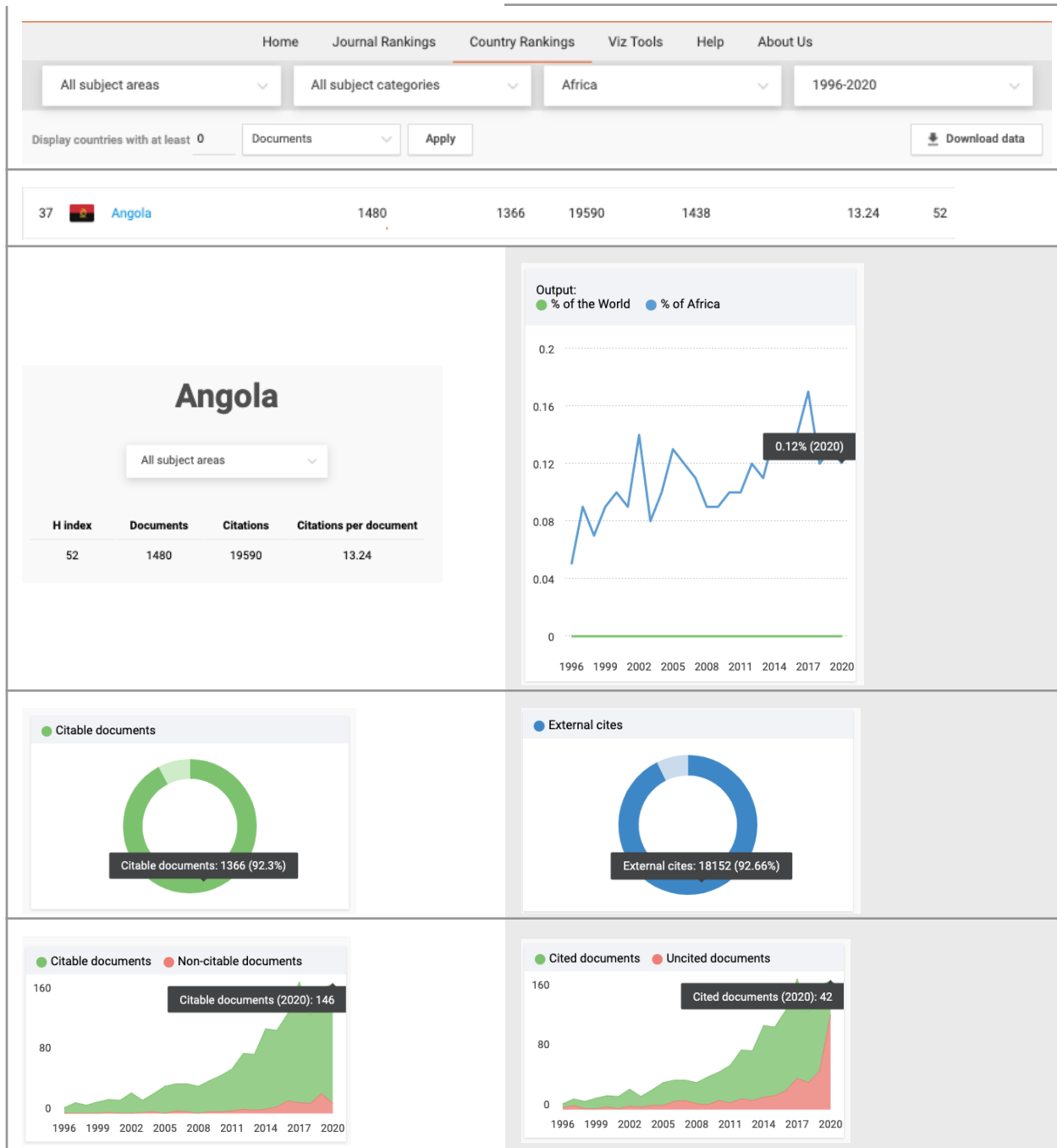
SCIENTIFIC PRODUCTION BY COUNTRY FROM SCOPUS, SJR

Country	# Documents	Citable Documents	Citations	Self-Citations	Citations per Document	H-index
1 South Africa	342042	306449	5827984	1090209	19.81	301
2 Egypt	266943	232764	3841277	609621	11.80	122
3 Nigeria	119048	118620	1219154	218826	8.84	129
4 Tunisia	104921	98621	1827580	198274	8.82	114
5 Algeria	84170	80961	732764	148954	8.82	102
6 Morocco	82248	77389	764214	154854	9.32	122
7 Kenya	44570	39647	341227	12682	11.12	100
8 Ethiopia	34552	32187	485284	10584	12.89	179
9 Ghana	33547	26980	381278	12882	13.82	112
10 Uganda	22579	20884	402882	42128	20.24	108
11 Tanzania	22226	20390	494158	18584	19.82	101
12 Cameroon	20794	19321	383678	31281	14.72	138
13 Zimbabwe	18862	17622	219759	32108	16.26	131
14 Senegal	12872	11882	148926	17821	16.82	107
15 Sudan	11748	10828	148127	12882	12.78	118
16 Malawi	9822	9219	181278	20882	20.78	106
17 Botswana	9488	8917	138928	12288	14.88	117
18 Burkina Faso	8288	7726	138218	17821	16.78	118
19 Côte d'Ivoire	7842	7386	109821	18821	14.81	127
20 Zambia	7821	7428	144888	14888	21.21	148
21 Liberia	7882	6728	74728	3227	10.88	88
22 Benin	6872	6482	138728	13821	18.78	127
23 Congo	5828	5219	148828	2742	18.88	122
24 Madagascar	5482	4872	84218	12821	16.82	106
25 Mozambique	5182	4826	128821	9122	24.22	116
26 Namibia	4848	4226	82128	6821	17.12	114
27 Rwanda	4574	4212	84828	5821	18.87	97
28 Mauritius	4488	3879	128828	5288	12.28	91
29 Mali	4026	3899	88822	7127	20.21	118
30 Gabon	3282	2968	72282	6222	22.87	112
31 Gambia	3112	2823	138178	2814	42.14	107
32 Niger	2721	2371	48827	3728	17.88	88
33 Togo	2682	2276	38882	1818	12.28	88
34 Swaziland	1828	1674	24122	1878	12.88	87
35 Democratic Republic Congo	1848	1687	32818	1278	18.87	78
36 Sierra Leone	1827	1788	38827	2524	18.28	84
37 Angola	1480	1386	19988	1488	13.24	82
38 Guinea	1312	1188	28218	1427	20.88	78
39 Central African Republic	912	818	15421	827	16.84	88
40 Burundi	888	808	12828	821	17.18	88
41 Reunion	888	808	15142	227	17.88	88
42 Lesotho	887	818	8818	488	11.18	48
43 Mauritania	812	808	12827	718	11.82	47
44 Seychelles	842	774	28821	1282	30.28	88
45 Liberia	788	687	17818	888	22.88	88
46 Guinea-Bissau	788	721	18184	2847	23.24	84
47 Eritrea	717	725	11484	678	16.74	48
48 Chad	782	687	11818	888	17.82	47
49 Cape Verde	482	451	8888	382	18.87	84
50 Somalia	218	228	3811	147	16.88	28
51 Djibouti	228	208	3221	228	14.28	28
52 Equatorial Guinea	258	258	3888	387	22.82	31
53 Comoros	182	178	3221	148	18.88	21
54 Republic of South Sudan	112	92	848	18	8.48	12
55 Mauritius	112	108	848	32	7.58	14
56 New Territories and Princes	92	87	1422	87	16.87	22
57 Saint Helena	58	48	482	5	8.87	12
58 British Indian Ocean Territory	32	28	482	5	16.88	8
59 Western Sahara	11	7	88	5	8.87	8

Table 2 Volume of scientific documents published by country and identified in Scopus, 2021. SJR, Scopus, 2021

Of the 1,480 documents published by Angola between 1996 and 2020 -and identified from Scopus, based on the SJR-, it stands out that close to 90% have been derived from international scientific collaboration (87.7%). It also highlights that the scientific production of Angola, identified from this database, mainly accounts for scientific production related to Medicine (37%). The general profile of Angolan scientific production identified from Scopus, based on the SJR, is represented in Table 3.

ANGOLA SCIENTIFIC PRODUCTION (1996-2020) FROM SCOPUS, SJR



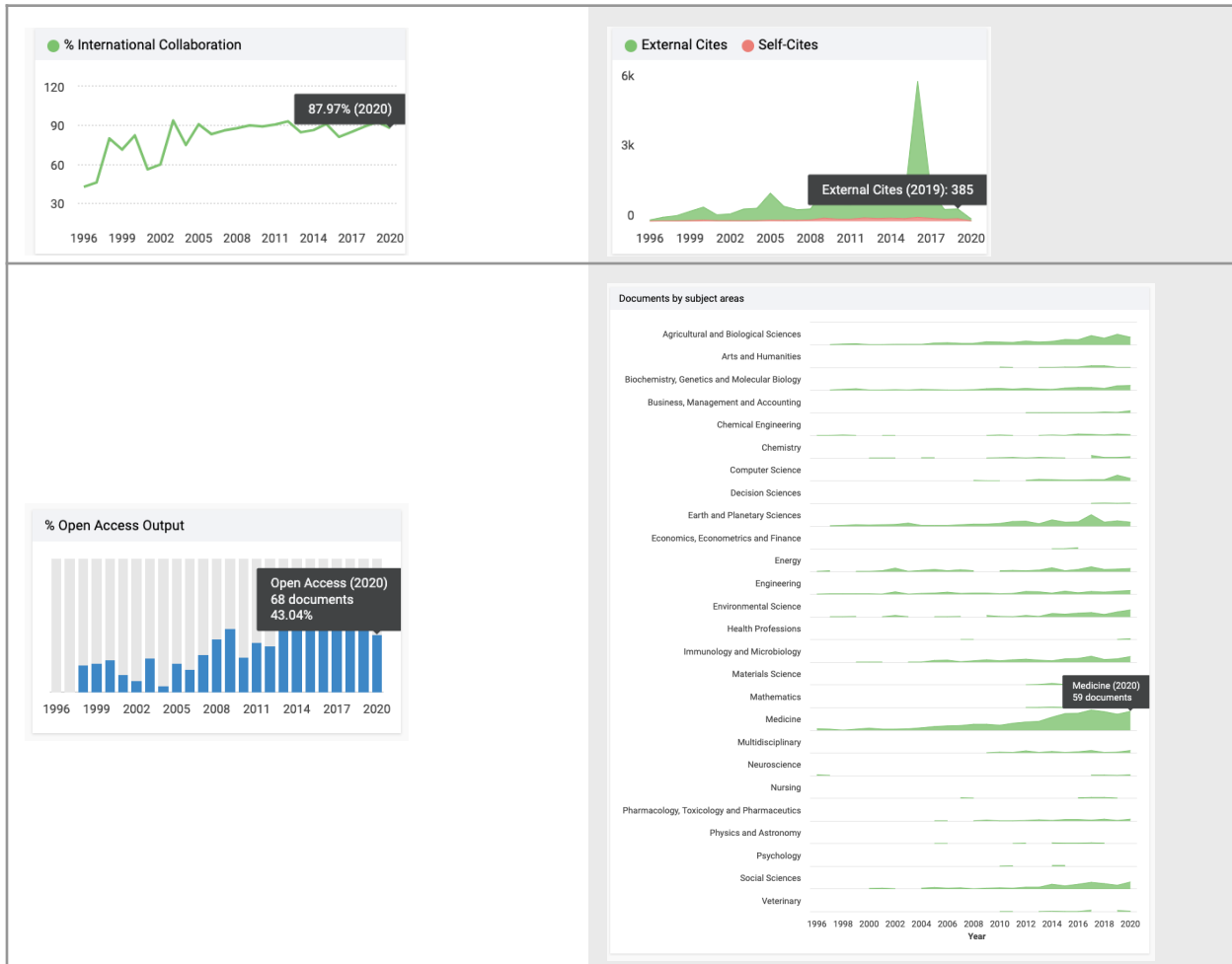


Table 3 Scientific production of Angola (1996-2020) identified from Scopus. SJR, Scopus, 2021

**The Open Access infrastructure of Africa and Angola: the perspective from ROARMAP**

Open Access, seen this time from the number of mandates registered in ROARMAP, is characterized by having a global infrastructure made up of 1,097 mandates or policies adopted between 2005 and 2021 from around the world. In this it highlights that most derive mainly from organizations that carry out research

or sub-units of these; in second place are the funders, followed by the articulation between funders and research institutions, and other organizations linked to this activity (see Figure 9).

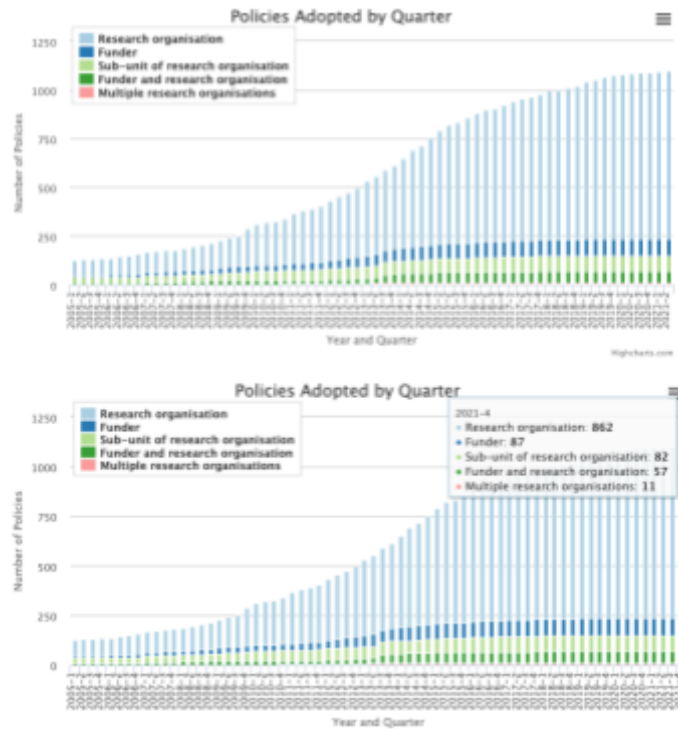


Figure 9 Open Access policies and mandates from around the world registered in ROARMAP, 2005-2021. ROARMAP, 2021

A central characteristic of the instrumental infrastructure of Open Access is that the policies identified from ROARMAP come mainly from the Global North: Europe and North America. Also, most of them make a mandate on “gold” or “green” Open Access as imperative.

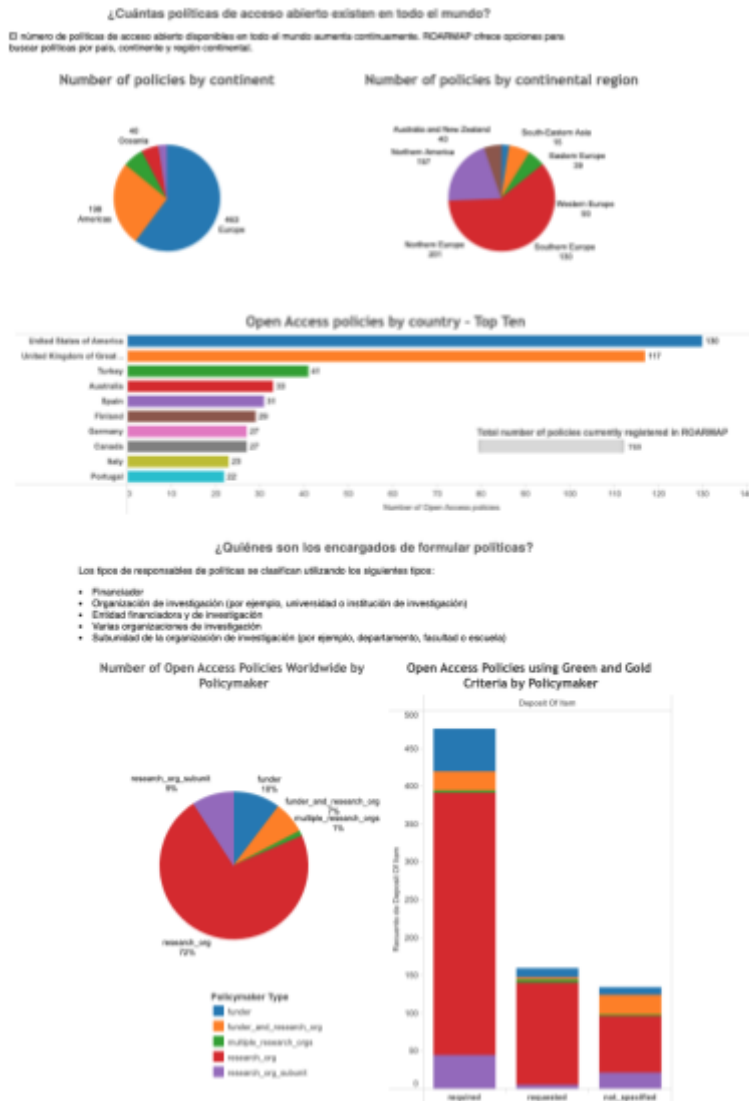
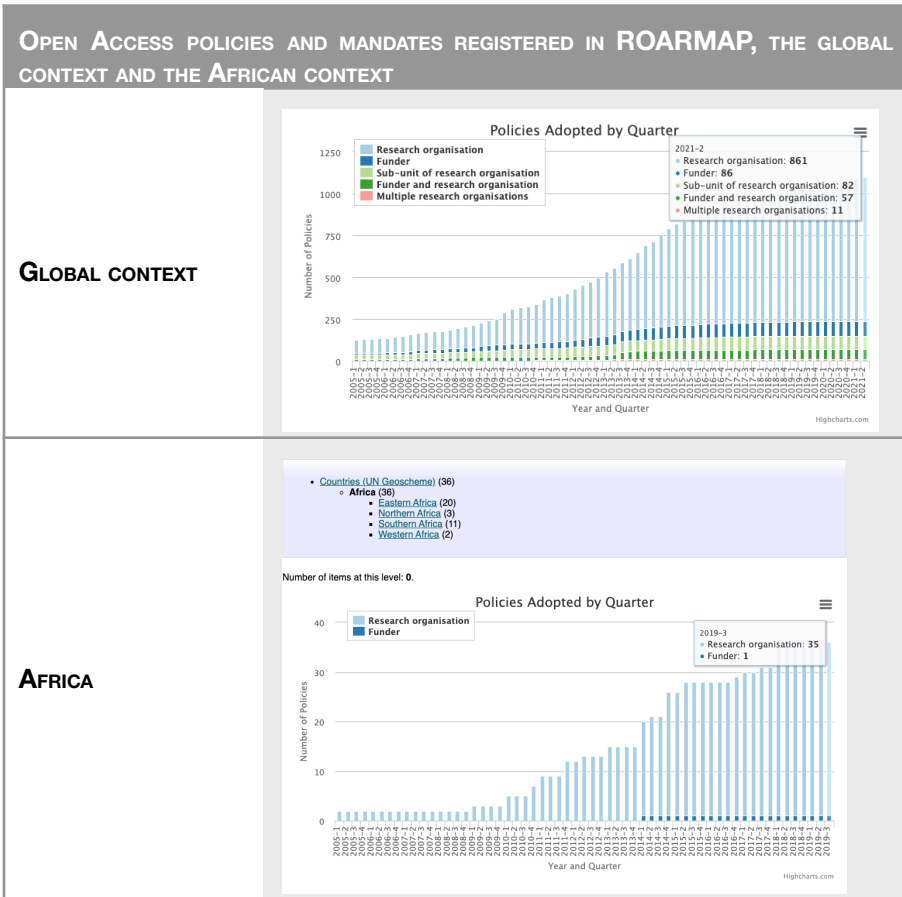


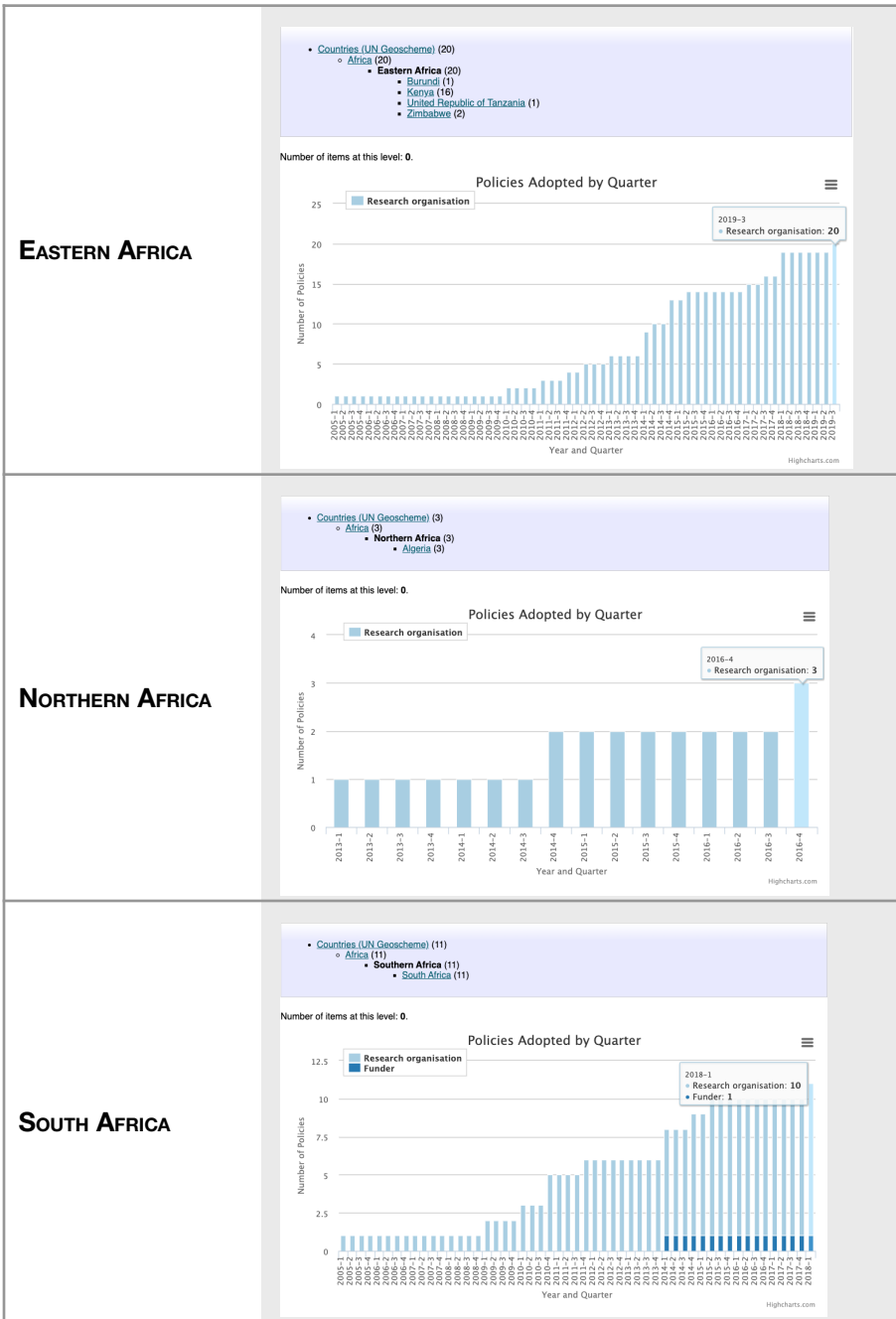
Figure 10 Origin and type of Open Access policies from around the world registered in ROARMAP, 2005-2021. (ROARMAP, 2021)

In the distribution by region of the Open Access policies and mandates identified from ROARMAP, an inequitable distribution is observed where only 3.3% corresponds to instruments from Africa. For their part, within Africa, these mandates correspond mainly to countries in the eastern region (Burundi, Kenya,

Tanzania and Zimbabwe), followed by South Africa; while the North (Algeria) and West (Ghana and Nigeria) regions register 3 and 2 terms respectively. In this scenario, it stands out that Angola does not have any registered Open Access policy or mandate instrument (see Table 4).







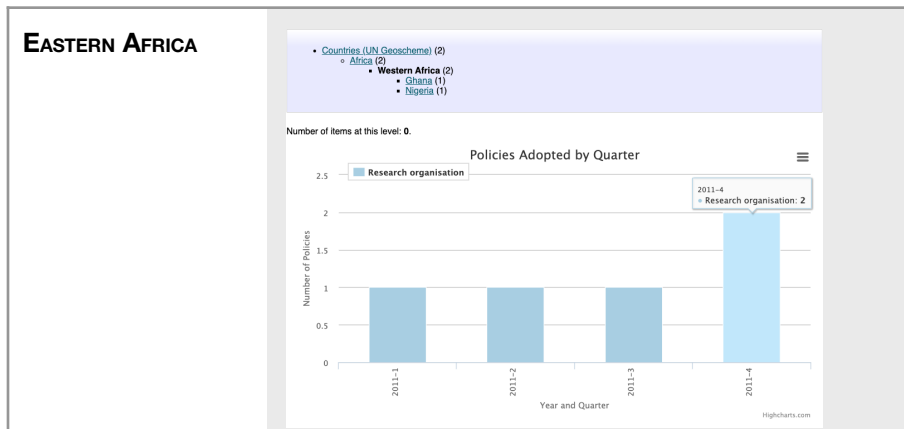


Table 4 Open Access policies and mandates registered in ROARMAP, global context and African context. ROARMAP, 2021

## A non-commercial rout of scientific communication: Diamond Open Access

### *Towards an Open Access and an Open Science protected from commercial use and directed to the needs of each context*

One of the critical approaches from which this document parts is that Open Access shows a structural limitation of origin in its founding statements. In the declarations of Budapest (2002), Bethesda (2003) and Berlin (2003) -which are considered the main instances of conceptualization and consensus of Open Access-, the central objective established was to open the academic literature, without considering the model of business of different publishing models. In other words, the important thing was openness, making the texts available to humanity without any type of access restriction. At the same time, this perspective left aside the search for structural equity, epistemic justice in the field of scientific communication and the articulation of the openness of scientific knowledge with the local needs of society.

It can be established that the conceptual and epistemic absence that led to not articulating the openness of academic content with the business model of the various publishing ecosystems. Specifically, the business model that would support the Gold model, in the future, via APC (Article Processing Charge) was not considered; nor was the creation of value networks considered in non-commercial publishing models such as the Diamond. This disrupted the ultimate objectives of Open Access: the construction of the great conversation of science, the meeting of the best minds for the benefit of humanity (Guédon, Open Access: Toward the Internet of the Mind, 2017).

This structural limitation does not seek to change from the North Atlantic. The Open Access strategy proposed by this region based on Plan S (coAlition S, 2018), does not put the business model of publication systems into discussion. This is how the representative of Plan S exposes it:

“If we had the opportunity to start scholarly publishing from scratch, this is certainly the way we would choose to do it: academic-led, non-profit, technically competent and scientifically sound open access publication (...) However, try as we may, we cannot make commercial publishers magically disappear” (Rooryck, 2020).

In turn, the response of the global South has been a criticism of the commercial mechanisms through which it seeks to promote access to scientific literature from the Open Access strategy proposed by the North Atlantic:

“It is discouraging to admit that the main criticism of Plan S is accurate: that it is a Eurocentric proposal that aims to eliminate paywalls to achieve Open Access, but does not seek to reduce profits and the concentration of power over the scholarly publication enjoyed by a small number of

commercial publishers. As such, Plan S resembles an accounting project, although potentially transparent: transferring subscription funds towards processing charges for scientific articles -APC- (...)” (Aguado-López & Becerril-García, The commercial model of academic publishing underscoring Plan S weakens the existing open access ecosystem in Latin America, 2020).

In the current context facing scientific communication and Open Access, the following should be highlighted:

1. The UNESCO Open Science Recommendation (2021) clearly emphasizes the relevance of business models that support scientific communication and distances itself from the business model.
2. Latin American organizations have emphasized a non-commercial model of open scientific communication (CLACSO-REDALYC-AMELICA).
3. The insufficient look of Plan S to the Diamond model (Bosman, Frantsovåg, Kramer, Langlais, & Proudman, 2021).
4. The proposal of countries like France that, in its 100 actions, seeks to favor openness. Among these, it clearly emphasizes that it will support the Diamond model and adhere to Plan S, and for this it opens the discussion on the characteristics that the policy will assume with strong events in the first quarter of 2022.
5. The definition of Redalyc-AmeliCA as infrastructures of the Diamond model and the non-acceptance of journals with APC.

### *Open Access: openness versus equity*

In the Declarations of Budapest (2002), Bethesda (2003) and Berlin (2003), Open Access was conceptualized mainly in terms of access and the types that were approached were two: the green way, referring to institutional and thematic repositories; and the golden route, referring to peer-reviewed journals. Although each of the Declarations introduced different elements to the debate on open scientific communication, it can be established that Open Access was conceptualized exclusively from the ways in which access to content could be given, without considering, for example, the business models that allowed the sustainability (or profitability) of each publication model (Aguado-López, 2021).

Subsequently, the dichotomous green and gold Open Access scheme has gradually become more complex, given the emergence or recognition of various publication and business models. In this regard, it should be noted that a model began to take a shape that articulated two elements: the search for openness of scientific content (the fundamental meaning raised in Budapest, Berlin and Bethesda) and the APC. In 2006, for example, the PLOS Biology journal of the Public Library of Science (PLoS) emerged, which defines itself as a nonprofit and AA organization but maintains high profit margins. Nature Research (Springer Nature) followed this axis: in 2011 it launched Scientific Reports. O'Reilly and SAGE launched PeerJ in 2013.

This strategy was not only undertaken by private publishing groups, but by research organizations. An example is eLife magazine, founded in 2012 and supported by the Max Planck Society, Wellcome Trust, the Howard Hughes

Medical Institute, and the Knut and Alice Wallenberg Foundation. It should be noted that since 2017 the magazine has charged for APC and currently the amount is significantly high, even higher than that identified in some magazines from private publishers. Also, in 2008 Springer acquired BioMed Central, today Springer Nature.

The point that seeks to come across is that the forms of categorization of Open Access initially conceptualized in Budapest, Bethesda and Berlin, became more complex and diverse, since in practice, communication in effect took place from repositories or scientific journals, but around these, practices not considered in such Declarations arose; which did not raise the problem around how the different models of scientific communication operate and are sustained. As a consequence of the foregoing, it was also omitted to consider the structural capacity for inclusion and the sustainability of each publication model. In other words, the central concern was openness, not the search for inclusion.

In Budapest, Bethesda and Berlin, the Golden Route category was associated with that of scientific journals with open content, regardless of the business model they had (Suber, Acceso Abierto, 2015). However, with the emergence or increasing adoption of the APC, a debate began to arise around the categorization of the “golden route” and even Open Access. One of the positions that can be identified is one that proposes to continue associating the “golden route” with scientific journals in general, as if it were a homogeneous universe.

Another position proposes to stop associating the “golden route” with journals in general and to associate it only with those with open content, but that carry out charges for APC (Aguado-López, 2021); while in other spheres, the category “golden route-APC” is beginning to be used to refer to these journals. Thus, the

categories of "golden route", "golden route-APC" and even that of "Open Access" are under debate and reconfiguration. An example in this regard is raised by Guédon (2021) and Suber (2021): around whether the exclusion of academic communities that occurs from the possibility or not of publishing under a conditioning by APC (Massarani, Rodrigues, Longmene, Badr, & Mazouzi, 2021); These authors discuss whether it is a consequence of "Open Access", "the golden route" or "the golden route-APC".

For their part, those journals with open content and that do not charge for APC sought their specificity of nomenclature and are associated with the Diamond Open Access category or, occasionally, Platinum Open Access (Fuchs & Sandoval, 2013); (Farquharson & Wadsworth, 2018). Likewise, some characteristics that have been considered in the name of Diamond Open Access are the central participation of educational, academic and non-profit institutions in the management and subsidization of scientific journals, a concept in turn associated with the search for social justice and epistemic (Raju, From green to gold to diamond: open access's return to social justice, 2018); (Raju, Claassen, Madini, & Suliama, 2020), the use of open licenses for the reuse of content and the promotion of diverse, inclusive and locally relevant scientific communication that is expressed in multilingualism.

The characteristics from which Diamond Open Access has been defined denote, in turn, some fundamental principles of this publication model, as outlined by Aguado-López (2021):

1. It starts from a conceptualization of scientific knowledge as a common and public good. Based on this, it operates away from market logic.



2. It adheres to the recognition of access to scientific knowledge and participation in the scientific narrative as basic universal rights that cannot be conditioned on a payment for access, publication or processing.
3. It has its origin in scientific societies, for example, the Royal Society of London until 1930 (Fyfe, 2020) and universities, since their mission is the generation and communication of knowledge.
4. It considers two fundamental principles of Open Access and prior to it: A) the consent of the authors for the reuse of their contents, therefore it promotes the use of open licenses according to the rights that the owner decides to assign or retain for legitimate academic uses; B) the existence of digital media that enable the generation, circulation and non-rivalry of scientific knowledge as a common good of knowledge (Suber, 2016).

The Open Access strategy that parts from this roadmap for the development and adoption of an Open Access policy in Angola is oriented towards a Diamond Open Access, which can be succinctly defined as that which

“does not charge for access, processing, or publication; where the academic-university sector is the central figure in the management and support of scientific journals and in general of the technological infrastructure of scientific communication; promotes the use of open licenses for the reuse of content (prioritizing non-commercial use), as well as multilingualism. For its part, the OA gold model is understood to be one that charges for processing or for publication, is generally supported by private publishing groups, focused on monolingual scientific communication (English language) and makes use of licenses that enable the commercial use of the scientific contents” Aguado-López (2021).

---

***The mainstream and the global conversation: loss of property and the transfer of resources to the global North***

The "mainstream" way of science has become a recurring term in the field of scientific communication and academic evaluation. It references the dominant model of academic communication characterized by circumscribing to Web of Science and to Scopus the analysis of the performance of researchers, despite the biases that have been documented in relation to their idiomatic, geographical and disciplinary representativeness (Guedón, 2013; Beigel, 2013; Aguado-López & Vargas, 2016; Martín-Martín, Orduna-Malea, Thelwall, & López-Cózar, 2019), mainly with underrepresentation of languages other than English, of the global South and of Social Sciences and Humanities.

The characterization of scientific performance from these databases shows a concentration by the global North. If Scopus is taken as a reference, from the SJR (2020), for example, it is observed that 81.6% of the journals, 84.3% of the documents and 94.7% of the citations belong to the global North. This distribution shows that the "mainstream" way offers a characterization of scientific performance where the North is the region with the largest number of journals considered legitimate, where the largest number of documents are published and where the academic prestige, denoted in citations, are deposited mainly in this region (see Figure 11).

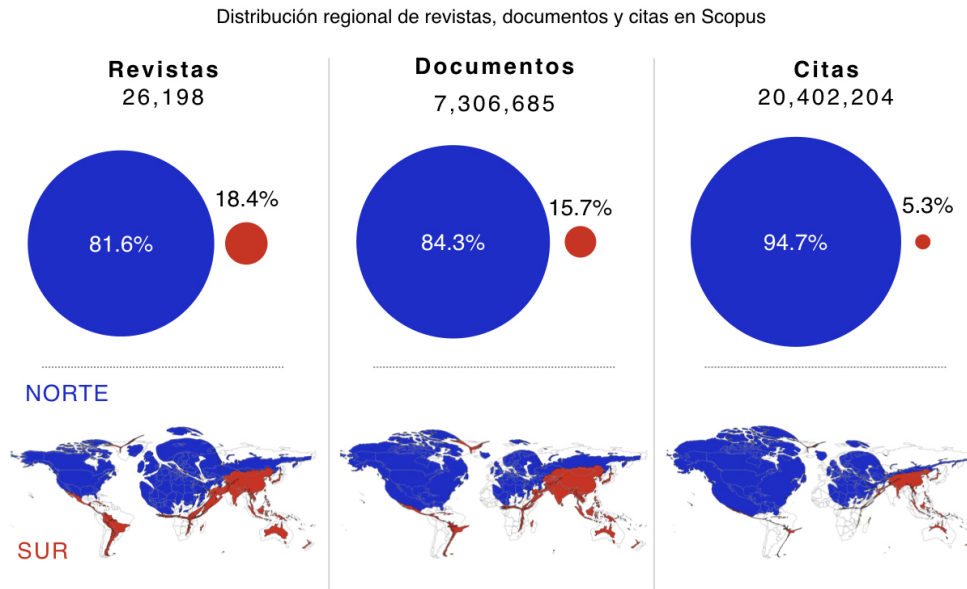


Figure 11 Regional distribution of journals, documents and citations in Scopus. (Aguado-López, *De la esperanza al fracaso. La privatización del acceso abierto a veinte años de las 3 B* [From Hope to Failure. The Privatization of Open Access Twenty Years from the 3 B], 2021)

Meanwhile, the contribution made by each region in terms of research, seen from Scopus, shows that 52.6% of scientific documents come from the North, while the global South has contributed 47.4% of them, with a central participation of Asia (see Figure 12). The asymmetric distribution in terms of journals, citations and documents published in each region, in contrast to a relatively balanced distribution between the generation of scientific knowledge, reveals a transfer of resources to the North: the global South has a minimal number of scientific journals and citations in Scopus; however, it contributes practically half of the scientific knowledge.

In other words, the South generates scientific knowledge practically to the same extent as the North, but the prestige goes almost exclusively to the last mentioned. Similarly, despite the fact that practically half of the scientific content

published in Northern journals comes from the South, scientific communication channels in this region are not considered legitimate by Scopus (which is why only 18.4% of journals is external to the global North).

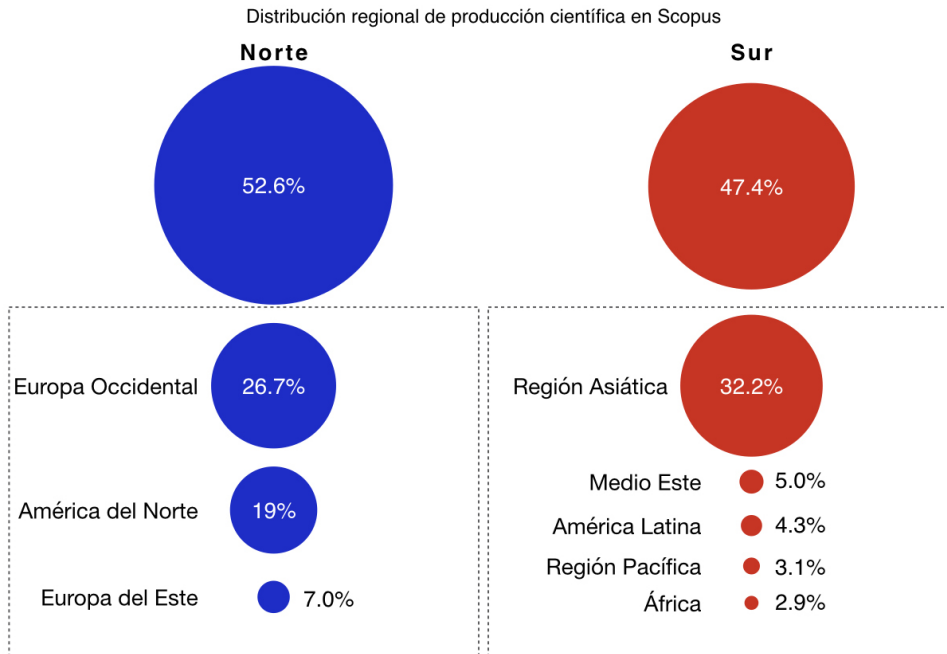


Figure 12 Regional distribution of scientific production in Scopus. (Aguado-López, 2021)

The equitable participation of scientific knowledge, as documented by Scopus, acquires a particular relevance if it is considered that a large volume of scientific journals that make up said database operate under an APC scheme, "lo que permite sustentar que el Sur, bajo el modelo de pago por publicación o procesamiento, se convertiría en un exportador neto de recursos económicos al Norte al tener que pagar por participar en este universo editorial y que de ninguna manera la inclusión de revistas del Sur permitirá compensar esta asimetría, si se considera, además, que la mayoría de las revistas del Sur están posicionadas en los cuartiles y posiciones más bajos [which allows sustaining that the South, under the model of payment for publication or processing, would become a net

exporter of economic resources to the North by having to pay to participate in this editorial universe, and that in no way the inclusion of magazines from the South will make it possible to compensate for this asymmetry -if It also considers that most of the magazines from the South are positioned in the lowest quartiles and positions-]”(Aguado-López, 2021).

### **The construction of an Open Access in Angola**

#### ***The comprehensive diagnosis of Angola's scientific and editorial activity: the relevance of an Open Access policy in Angola***

The initial part of the project from which this document is derived constitutes a comprehensive diagnosis of Angola's scientific and editorial activity (see sections 1.1 to 1.10 of the integrating project). The axes of the diagnosis addressed: the knowledge generation trends of the Angolan scientific communities and their circulation channels (in the “mainstream” -Scopus, Elsevier and Web of Science, Clarivate Analytics- and in Open Access platforms -DOAJ, AJOL, Redalyc and SciELO-), the editorial practices of their journals and the internationalization they have built, the instrumental infrastructure of Angolan Open Access based on institutional mandates or policies, the status of university publishing houses and the publication of books; as well as the perspectives of the academic, scientific, student communities, and government authorities regarding Open Access; and the needs that they identify from two participatory and integration mechanisms: a series of focus groups and a digital survey.

In general, a diverse and heterogeneous group of stakeholders from three fields was identified: 1) Academic authorities; 2) Researchers and/or outstanding professors from universities, research centers and institutions of higher education; 3) Authorities from the political sphere and diverse stakeholders with political incidence in the educational, scientific and technological context. The identification of these stakeholders was accompanied by an invitation to participate in two joint consultation and reflection exercises, a series of focus groups and a digital survey, with which it was sought to know the needs and perceptions of Angola regarding Open Access and Open Science.

For its part, the diagnosis from Scopus and Web of Science, as well as from DOAJ, AJOL, Redalyc and SciELO, allowed to characterize Angola's performance in two types of scientific communication circuits, the first mainly characterized by having Journals with APC or with restricted access to their content, the latter characterized by being Open Access platforms. In all cases, the scientific production that addresses Angola as an object of study was analyzed in the same way. One characteristic identified was that Angola's scientific publication is mainly carried out in non-commercial scientific journals (without APC). Likewise, a problem identified is related to the interoperability and proper handling of metadata by most of the platforms used, which limited the scope of the diagnoses.

For its part, the analysis of the editorial and internationalization characteristics (publication and international collaboration) of the scientific journals of Angola, allowed to identify that they are in a phase of consolidation and construction of

diverse communities of knowledge, an aspect that is articulated with the editorial practices they have, which show great areas of opportunity to enhance their presence as diverse and inclusive scientific communication channels.

Regarding the instrumental infrastructure of Open Access in Angola, based on institutional policies and mandates, few application experiences were identified, which reflects the relevance and urgency of building formal instruments that enhance and formalize the open scientific communication that are already carried out by the scientific and publishing communities of this country. The axis of this diagnosis is related to the one that refers to university publishing houses and the publication of books, where it was identified that publishing activity shows areas of opportunity aimed at strengthening and giving uninterrupted continuity to this.

The synthesis of the findings derived from the comprehensive diagnosis of the scientific and editorial activity of Angola, allows to conclude the need for an Open Access policy in Angola that enhances, promotes and enriches its academic work. The relevance of an Open Access policy in Angola is revealed as an opportunity for the country to lay the foundations for open scientific communication based on inclusion, collaboration, multilingualism and the local relevance of scientific research; all from a non-commercial publication infrastructure and in coherence with the Universal Rights related to science: to access scientific knowledge, to participate in its benefits and to participate in the scientific narrative in permanent construction.

The development and construction of an Open Access policy in Angola, in the medium and long term, should be articulated with A) the design and implementation of instrumental policies (institutional mandates or policies of Open Access), B) programs to promote open scientific communication, C) academic



evaluation schemes that value and, therefore, promote the generation of scientific knowledge in non-commercial Open Access communication circuits, and D) all instruments and strategies that, from a systematically coherent approach, promote Angola as a non-commercial, technologically competent Open Access benchmark that belongs to and is managed by the academic-university environment, and that constitutes a means for the integral development of Angolan society, African societies and humanity as an all.

### *Towards an Open Access policy in Angola: Opening and integrating step by step*

Having:

- developed the recognition of science as a Human Right and the different formal instruments that seek to promote it, among them, the UNESCO Recommendation on Open Science;
- contextualized to Africa and Angola in their perception and needs related to Open Access and Open Science, as well as from their conditions and development in the scientific and open field;
- problematized the structural limitations of Open Access from its founding declarations, which in part derived in the legitimation and institutionalization of a model of scientific communication directed by the private publishing sphere and concentrated by the global North;
- raised the implications of the relevance of a publication model oriented towards the APC;

- and presented the findings derived from the comprehensive diagnosis to the scientific and editorial activity of Angola;

The following is a general outline of a proposed roadmap for the development and adoption of an Open Access policy in Angola. This is part of the absolute recognition of the autonomy and sovereignty of Angola, as well as the institutions and codes that constitute it as a country. Likewise, it starts from the recognition of the potential of South-South collaborative work to build spaces and practices for the benefit of their societies based on their shared historical trajectories and the knowledge built in decades of work, bonding and learning.

#### 1 A policy based on integrated reflection and consensus

- The Open Access policy in Angola must start from a construction step by step, gradually.
- The Open Access policy in Angola must start from an integration of all the stakeholders; it cannot start as an expert discussion.
- The discussion of experts must take place in parallel with the training and insertion of the different sectors of society.
- The proposal for discussion must take as a basis for discussion the Open Science Recommendation approved by all Unesco member countries in November 2021:
  - Promote a common definition of open science, the benefits and challenges it entails, and the various means of accessing it.
  - Create an ideal environment for open science.
  - Invest in open science infrastructure and services.
  - Invest in human resources, training, education, digital literacy and capacity building for open science.

- Promote a culture of open science and harmonize incentives for open science.
- Promote innovative approaches to open science at different stages of the scientific process.
- Promote international and multi-stakeholder cooperation in the context of open science and with a view to reduce digital, technological and knowledge gaps.

## 2 The constitution of a National Open Access Committee in Angola

- This will have a pentahelix character and must maintain a balance between the five sectors: Government, civil society, academic-scientific sector, international advisers and private sector..
- Its formation and structure must be carried out in a national and public event, in order to show the importance that the Ministério do Ensino Superior, Ciência, Tecnologia e Inovação (MESCTI) of the Angolan government bestows on the Open Access policy in Angola and, in general, to promote Open Access and Open Science.
- It must be created and legitimized in the first event of the construction of the Open Access policy in Angola, which can be called in a National Congress of Open Access, Open Science and Artificial Intelligence, to which all the stakeholders are articulated and dated the first semester of 2022.
- A small working group should be formed to implement the legal structure at multiple levels: constitutional, education, science and technology, institutions of higher education, libraries, etc.

- 
- One of the elements that make up the pentahelix of the National Open Access Committee in Angola refers to international advisers. These will be made up of the Redalyc Scientific Information System, AmeliCA, the Latin American Council of Social Sciences from the Latin American Forum on Scientific Evaluation and DORA.
- 3 The planning and conformation of the Open Access Policy in Angola
- The planning and creation of the structure that will support the development of the Open Access Policy in Angola will take place during the second half of 2022.
  - For the planning and creation of the structure that will support the development of the Open Access Policy, an Open Access and Open Science Office of Angola will be created, which will support and advise on these tasks and will constitute the first antecedent of one of the elements that make up the pentahelix of the National Open Access Committee in Angola: the international advisers.
- 4 The 2023 horizon: the Open Access, Open Science and Artificial Intelligence triad
- With the time horizon of 2023, training and dissemination campaigns will be carried out in the educational sector of Angola at all levels, aimed at establishing a universal background of knowledge on Open Access, Open Science and Artificial Intelligence and its relevance in scientific communication.
  - Training and dissemination campaigns should not involve costly actions that distract from daily activities, but rather the use and innovation in Open Access should be sought from the early activities and rooted in everyday school, educational, academic and scientific activities.

- A literacy for the knowledge society should be sought: Open Access Generating Words, Open Science and artificial intelligence under the Freire method.
  - The training and dissemination program should include government authorities, mainly those related to the field of science and technology.
  - Operationally, the training and dissemination program will be carried out under the conformation of Operative Cells under the pentahelix model.
  - A substantial part of the program must be the discussion and integration of the academic evaluation structures in coordination with the objectives of the Open Access, Open Science and Artificial Intelligence triad.
- 5 The 2024 horizon: the implementation of the non-commercial Open Access structure in Angola
- With 2024 as the horizon, a non-commercial Open Access structure will be implemented in Angola that will have two components: one conceptual, operational and legal; and another of a technological nature.
  - The conceptual, operational and legal edges will be implemented from strategies that involve:
    - Legal and regulatory: legal and operational foundations that give legal support to a non-commercial Open Access in Angola. This will derive mainly from the governmental structure, and in coherence, the institutions and autonomous organisms will be able to incorporate them.
    - Plans and programs: strategies of different scope and of a transversal type will be established aimed at bringing non-commercial Open Access to the field of feasibility in Angola.
    - Research incentives: evaluation, monitoring and promotion of academic and scientific activity will be carried out aimed at promoting the

adoption and practice of non-commercial Open Access in Angola in the field of generating scientific knowledge.

- Establishment of knowledge networks for the Open Access, Open Science and Artificial Intelligence triad: knowledge networks will be established permanently between actors of diverse scope and incidence, in order to design and implement strategies, projects, initiatives and financing that result in the strengthening of a non-commercial Open Access in Angola.
  - The technological edge refers to the establishment of infrastructures that technically will allow non-commercial Open Access in Angola. These should consider:
    - Repositories of various kinds, mainly those aimed at the visibility of scientific knowledge published in various digital and electronic formats.
    - Publication system:
      - Diamond Magazines (no APC fee)
      - Books
      - Publications of diverse nature.
    - Data:
      - Repositories
      - Technological literacy
  - Educational programs on digital platforms that promote and permanently train in Open Access, Open Science and Artificial Intelligence.
  - Automatic structure of indicators that allows monitoring the academic and scientific activity of Angola in the open.
- 6 The 2025 horizon: an evaluation and reordering of the Open Access Policy in Angola

- 
- Considering the development, trajectory and results achieved, in 2025, a comprehensive evaluation of the points raised in this roadmap will be carried out, in order to have a support of information that allows redirecting, reordering or re-establishing the Open Access policy in Angola and the different strategies and instruments projected within its framework.



## Bibliography

- Aguado-López, E. (2021). De la esperanza al fracaso. La privatización del acceso abierto a veinte años de las 3 B. En A. Becerril-García, & S. Córdoba (Edits.), *Conocimiento abierto en América Latina. Trayectoria y desafíos* (pp 37-78). Buenos Aires, Argentina: Consejo Latinoamericano de Ciencias Sociales (CLACSO). Obtained from <https://biblioteca-repositorio.clacso.edu.ar/bitstream/123456789/15177/1/Conocimiento-abierto.pdf>
- Aguado-López, E., & Becerril-García, A. (May 20th, 2020). *The commercial model of academic publishing underscoring Plan S weakens the existing open access ecosystem in Latin America*. Recovered on December 2021 from LSE Impact Blog: <https://blogs.lse.ac.uk/impactofsocialsciences/2020/05/20/the-commercial-model-of-academic-publishing-underscoring-plan-s-weakens-the-existing-open-access-ecosystem-in-latin-america/>
- Aguado-López, E., & Vargas, J. (2016). Reapropiación del conocimiento y descolonización: el acceso abierto como proceso de acción política del sur. *Rev. Colomb. Soc.*, 39(2), 69-88. doi:doi: <http://dx.doi.org/10.15446/rcs.v39n2.58966>
- Beigel, F. (2013). Centros y periferias en la circulación internacional del conocimiento. *Nueva Sociedad*(245), 110-123. Obtained from [https://static.nuso.org/media/articles/downloads/3944\\_1.pdf](https://static.nuso.org/media/articles/downloads/3944_1.pdf)
- Beigel, F. (2021a). *América Latina podría convertirse en líder mundial de la ciencia abierta no comercial*. Recovered on December 2021 from

<https://es.unesco.org/news/america-latina-podria-convertirse-lider-mundial-ciencia-abierta-no-comercial>

BOAI. (2002). *Budapest Open Access Initiative*. Budapest: Budapest Open Access Initiative. Obtained from <https://www.budapestopenaccessinitiative.org/read/>

Bosman, J., Frantsvåg, J. E., Kramer, B., Langlais, P.-C., & Proudman, V. (2021). *OA Diamond Journals Study. Part 1: Findings*. Obtained from <https://zenodo.org/record/4558704>

Calvino, I. (1999). *Tiempos moderados*. Chile: Gambito.

Clarín, G. A. (2001). El pensamiento transgresor. *Horizonte*, 55-60.

cOAlition S. (2018). *Plan S*. Recovered on December 2021 from <https://www.coalition-s.org/addendum-to-the-coalition-s-guidance-on-the-implementation-of-plan-s/principles-and-implementation/>

Declaración de Bethesda sobre Publicación de Acceso Abierto. (2003). *Declaración de Bethesda sobre Publicación de Acceso Abierto*. Maryland: Declaración de Bethesda sobre Publicación de Acceso Abierto. Obtained from [https://ictlogy.net/articles/bethesda\\_es.html](https://ictlogy.net/articles/bethesda_es.html)

DECRETO por el que se reforman y adicionan diversas disposiciones de la Ley de Ciencia y Tecnología, de la Ley General de Educación y de la Ley Orgánica del Consejo Nacional de Ciencia y Tecnología (Poder Ejecutivo. Secretaria de Educación Pública 20 de mayo de 2014 [May 20th, 2014]).

DORA. (2012). *Declaración de San Francisco sobre la evaluación de la investigación*. Obtained from <https://sfhora.org/read/read-the-declaration-espanol/>

- Doyle, A. L. (1986). *El Acceso en la modernidad*. Madrid, Spain: Cubo.
- Farquharson, J. I., & Wadsworth, F. B. (2018). Introducing Volcanica: The first diamond open-access journal for volcanology. *VOLCANICA*, 1(1), 1-9. doi:<https://doi.org/10.30909/vol.01.01.i-ix>
- Fuchs, C., & Sandoval, M. (2013). The Diamond Model of Open Access Publishing: Why Policy Makers, Scholars, Universities, Libraries, Labour Unions and the Publishing World Need to Take Non-Commercial, Non-Profit Open Access Serious. *tripleC: Communication, Capitalism & Critique*, 11(2), 428-443. doi:<https://doi.org/10.31269/triplec.v11i2.502>
- Fyfe, A. (2020). The Royal Society and the Noncommercial Circulation of Knowledge. En M. P. Eve, & J. Gray (Edits.), *Reassembling Scholarly Communications: Histories, Infrastructures, and Global Politics of Open Access* (pp 147-160). Massachusetts: The MIT Press. doi:<https://doi.org/10.7551/mitpress/11885.001.0001>
- Guedón, J.-C. (2013). El objetivo de la gerencia científica ¿excelencia o calidad? *Revista de Tecnología de Información y Comunicación en Educación*, 7(Esp.), 63-92. Obtained from <http://servicio.bc.uc.edu.ve/educacion/eduweb/vol7nespecial/art3.pdf>
- Guédon, J.-C. (2017). *Open Access: Toward the Internet of the Mind*. Obtained from [https://openaccessprod.wpengine.com/wp-content/uploads/Guedon\\_BOAI15\\_FINAL.pdf](https://openaccessprod.wpengine.com/wp-content/uploads/Guedon_BOAI15_FINAL.pdf)
- Guédon, J.-C. (May 12th, 2021). *Tweet*. Obtained from jean-claude Guédon: <https://twitter.com/jcdrg/status/1392565361506234368>

- Hinojosa, F. (2000). *El niño come dulces*. México: Río.
- Martín-Martín, A., Orduna-Malea, E., Thelwall, M., & López-Cózar, E. D. (2019). Google Scholar, Web of Science, and Scopus: a systematic comparison of citations in 252 subject categories. *arXiv.org*. doi:<https://arxiv.org/ct?url=https%3A%2F%2Fdx.doi.org%2F10.1016%2Fj.joi.2018.09.002&v=f297204f>
- Massarani, L., Rodrigues, M., Longmene, B., Badr, H., & Mazouzi, R. (May 10th, 2021). *Open access 'excludes' developing world scientists*. Obtained from SciDevNet: <https://www.scidev.net/global/features/open-access-excludes-developing-world-scientists/>
- Milan, F. R. (1995). *Estadística del Norte*. México: Barco.
- Molino, M. M. (2020). El investigador. En R. C. Lara, *Mil maneras de saber* (pp 113-124). Cuba: Unidos.
- ONU. (1948). *Declaración Universal de Derecho Humanos*. París: Organización de las Naciones Unidas (ONU). Obtained from <https://www.un.org/es/about-us/universal-declaration-of-human-rights>
- ONU. (1966). *Pacto Internacional de Derechos Económicos, Sociales y Culturales*. París: Organización de las Naciones Unidas. Obtained from <https://www.ohchr.org/sp/professionalinterest/pages/cescr.aspx>
- Organización de los Estados Americanos. (1988). *Protocolo de San Salvador sobre Derechos Económicos Sociales y Culturales*. San José: Organización de los Estados Americanos. Obtained from <https://www.oas.org/juridico/spanish/tratados/a-52.html>

- Ortega, L. D. (2011). El nuevo código abierto. *Conferencia de Ciclos Modernos* (pp 89-96). Uruguay: Publicaciones Diamante.
- Palma, N. L. (July 16th, 1992). Público hambriento. *Diario Llave nueva*, pp 26-27.
- Raju, R. (2018). From green to gold to diamond: open access's return to social justice. *IFLA WLIC 2018*, (pp 1-9). Obtained from <http://library.ifla.org/id/eprint/2220/1/092-raju-en.pdf>
- Raju, R., Claassen, J., Madini, N., & Suliama, T. (2020). Social Justice and Inclusivity: Drivers for the Dissemination of African Scholarship. En M. P. Eve, & J. Gray (Edits.), *Reassembling Scholarly Communications: Histories, Infrastructures, and Global Politics of Open Access* (pp 53-64). Massachusetts: The MIT Press. doi:<https://doi.org/10.7551/mitpress/11885.001.0001>
- Rooryck, J. (January 30th, 2020). *La iniciativa para el acceso abierto Plan S genera más oportunidades que amenazas para Latinoamérica*. Recovered on December 2021 from LSE Impact Blog: <https://blogs.lse.ac.uk/latamcaribbean/2020/01/30/la-iniciativa-para-el-acceso-abierto-plan-s-genera-mas-oportunidades-que-amenazas-para-latinoamerica/>
- Saba, R. (2020). *Derecho a la ciencia: una mirada desde los derechos humanos*. París: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO). Obtained from <https://unesdoc.unesco.org/ark:/48223/pf0000374224>
- Scimago Lab. (2021). *Scimago Journal & Country Rank (SJR)*. Obtained from <https://www.scimagojr.com/>

- Suber, P. (2015). *Acceso Abierto*. (R. Melero, Trad.) Toluca, México: Universidad Autónoma del Estado de México. Obtained from <http://ri.uaemex.mx/bitstream/handle/20.500.11799/21710/Acceso%20Abierto.pdf?sequence=5&isAllowed=y>
- Suber, P. (2016). Crear bienes comunes intelectuales mediante el Acceso Abierto. En C. Hess, & E. Ostrom (Edits.), *Los Bienes Comunes del Conocimiento* (pp 189-225). Universidad de Altos Estudios Nacionales del Ecuador; Traficantes de sueños. Obtained from <https://www.traficantes.net/libros/los-bienes-comunes-del-conocimiento>
- Suber, P. (May 11th, 2021). *Tweet*. Obtained from <https://twitter.com/petersuber/status/1392164587194175496>
- UNESCO. (1971). *Convención Universal sobre Derecho de Autor*. París: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Obtained from [https://en.unesco.org/sites/default/files/repdom\\_convencion\\_universal\\_der echo\\_autor\\_spaorof.pdf](https://en.unesco.org/sites/default/files/repdom_convencion_universal_der echo_autor_spaorof.pdf)
- UNESCO. (1999). *Declaración sobre la ciencia y el uso del saber científico*. París: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Obtained from [http://www.unesco.org/science/wcs/esp/declaracion\\_s.htm](http://www.unesco.org/science/wcs/esp/declaracion_s.htm)
- UNESCO. (2009). *Charter on the Preservation of the Digital Heritage*. París: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Obtained from <https://unesdoc.unesco.org/ark:/48223/pf0000179529.page=2>

- UNESCO. (2015). *Informe Mundial de la UNESCO sobre la ciencia, hacia 2030: resumen ejecutivo*. París: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Obtained from [https://unesdoc.unesco.org/ark:/48223/pf0000235407\\_spa](https://unesdoc.unesco.org/ark:/48223/pf0000235407_spa)
- UNESCO. (2017). *Recomendación sobre la Ciencia y los Investigadores Científicos*. París: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Recovered on December 2021 from [http://portal.unesco.org/es/ev.php-URL\\_ID=49455&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/es/ev.php-URL_ID=49455&URL_DO=DO_TOPIC&URL_SECTION=201.html)
- UNESCO. (2019). *Proyecto de recomendación sobre los Recursos Educativos Abiertos (REA)*. París: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Obtained from [https://unesdoc.unesco.org/ark:/48223/pf0000370936\\_spa](https://unesdoc.unesco.org/ark:/48223/pf0000370936_spa)
- UNESCO. (2020a). *¿Qué es Ciencia Abierta? UNESCO lanza consulta global*. Recovered on December 2021 from <https://es.unesco.org/news/que-es-ciencia-abierta-unesco-lanza-consulta-global>
- UNESCO. (2020b). *Towards a global consensus on open science: report on UNESCO's global online consultation on open science*. París: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Obtained from <https://unesdoc.unesco.org/ark:/48223/pf0000375217?posInSet=5&queryId=28473ea4-beb9-4029-9e75-fb5421b8f4a2>

---

UNESCO. (2021a). *Sobre la UNESCO*. Recovered on December 2021 from <https://es.unesco.org/about-us/introducing-unesco>

UNESCO. (2021b). *Construir sociedades del conocimiento*. Recovered on December 2021 from <https://es.unesco.org/themes/construir-sociedades-del-conocimiento>

UNESCO. (2021c). *Recomendación sobre la ciencia abierta*. París: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Obtained from [https://unesdoc.unesco.org/ark:/48223/pf0000378841\\_spa](https://unesdoc.unesco.org/ark:/48223/pf0000378841_spa)