



Scientific Research: Publication and Visibility of Institutes and Countries in Relation to Development

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Abstract: The aim of this paper is to provide an overview of the role of scientific research in ranking universities at the international or African scale. The number and quality of journals published by institutions as well as their presence in databases such as Web of science, Scopus, Google Scholar, etc., affect their visibility and reputation. Each researcher has an identifier (ID) and is evaluated based on the publication number, total citations, Impact factor, etc. Findings on several databases show that China is the leader since the year 2000. In 2022, China published more than one million papers exceeding the US (702840 papers). Among African countries, Morocco ranks fourth behind Egypt, South Africa and Nigeria. The indexed journals on SCImago highlighted the urgent for policy makers to develop IMIST (Institut Marocain de l'Information Scientifique et Technique) to improve the scientific information and communication system in Morocco.

Keywords: Research; Scientific production; Journals; Visibility;

1. Introduction

Scientific production has become one of the major activity of most universities and plays a primordial role in the international rankings. The knowledge produced by scientific communities is diffused to serve a lever of the integrated and sustainable development of the society (Fuchs, 1986; Rolin, 2009). Increasingly, academic institutions understand the importance of their scientific production in relation to many problems of societies in various sectors such as agriculture, water, energy, computer, etc. (Lrhoul *et al.*, 2023; Bornmann *et al.*, 2021; Nizetić *et al.*, 2020; Hammouti *et*

al., 2010;). Scientific publication necessitates publishing houses that collect journals covering all disciplines such as Elsevier, Springer, Royal Society, Emerald, Taylor & Francis, John Wiley, Multidisciplinary Digital Publishing Institute known as MDPI, etc.

The large number of articles published in the world during the last centuries has led to the creation of databases that contain collection of journals belonging to numerous publishing houses. The most known are Google Scholar, Web of Science, Scopus, etc., which offer data on researchers and their affiliations and countries. This information has received more attention in reorientating the policies and economic visions of countries. Furthermore, the presence of bibliographic databases and academic search engines makes possible the classification of researchers, universities and countries around the world and regions.

Our aim is to give an insight on the scientific production in the world and in Africa during the year 2022 to attract the attention of policy makers to revise or reorient their policies according to the position of our Country (Morocco) first in the continent and then in the world.

2. Methodology (SCImago)

We use the SCImago Institutions Rankings (SIR) founded in 2009 that publishes the international ranking of worldwide research institutions by regions and globally. The SIR World Report gives an output on the scientific production (SP) of each country year by year as well as the citable documents, Citations, self-citations and Hirsh index (H-index) of the country. SIR also offers data by subject area and discipline (scimago.com).

3. International ranking

In their published work, [Ul Haq & Tanveer, \(2020\)](#) about the status of Research Productivity and Higher Education in the Members of Organization of Islamic Cooperation (OIC), pointed out that among 3946933 documents published worldwide in the year 2018 as reflected in SJR, United States (US) has been on the top with 11,809 (36.99%) source publications. US produced 683003 documents (17.30%) on the first rank, followed by China (n=599386; 15.18%) and United Kingdom (UK) (n=211710; 5.36%). Almost 62% of the world knowledge has been produced by 10 countries, while the rest of documents (38%) have been produced by 223 countries of the world.

Survey literature and dispoible data show that in 2020 China grows to the first place (774548 documents) compared to the US with 718834 documents followed by UK 231342 and India 216807. In 2022, the SP of China increased more to rich 1009891 against 702840 documents for US. The third position was for India (275367) and UK became at the fourth place (236145) ([Figure 1](#)).

3. African ranking

Our continent merits more attention to be developed and our goal is to expose some information about the SP of Africa ([Wenham et al., 2023](#)). Ten Best African (TBA) Countries produced 165510 documents ([Figure 1](#)) while the ten best countries in the world have been more than 3 million; in other words, TBA countries did not exceed 5%. South Africa and Egypt have been on the top with 27365 and 22631 publications respectively. Nigeria 10251 publications, Tunisia 8976, Algeria 8120 and Morocco occupied the sixth rank with 7728. In 2020, Egypt took the first place (32040) slightly on the S. Africa (31822), Nigeria 14625 and Morocco grows to the fourth place (10147). Data on SCImago indicated that ranking of these four countries is always maintained (Egypt, S. Africa, Nigeria and Morocco) ([Figure 1](#)). By the way, in 1998, African Journals OnLine (AJOL), the world's largest and preeminent platform of African-published scholarly journals, was founded. AJOL acts the principal

role increase global & continental online access, awareness, quality & use of African-published, peer-reviewed research. Millions of monthly downloads by site users from nearly every country in the world are an indication of the need and widespread use of the AJOL initiative. More than half of the repeat users are from Africa (<https://www.ajol.info/index.php/ajol>).

Country	↓ Documents	Citable documents	Citations	Self-Citations	Citations per Document	H index
1 China	1009891	985085	1135104	820277	1.12	1231
2 United States	702840	623186	735027	297310	1.05	2898
3 India	275367	248644	252555	108577	0.92	812
4 United Kingdom	236145	205867	308133	74296	1.30	1840
5 Germany	203406	183077	226806	63305	1.12	1602
6 Italy	152881	136051	187385	61254	1.23	1275
7 Japan	140493	130095	115731	31831	0.82	1251
8 Canada	130678	117417	156234	32199	1.20	1481
9 Australia	124503	111601	175958	38731	1.41	1293
10 France	123837	112159	137918	29621	1.11	1442

Figure 1: Scientific Production (Ten Best Countries) on Scimago at the Year 2022

Country	↓ Documents	Citable documents	Citations	Self-Citations	Citations per Document	H index
1 Egypt	44219	42493	65869	23815	1.49	388
2 South Africa	34268	31037	42967	9142	1.25	614
3 Nigeria	17128	15908	18731	5606	1.09	291
4 Morocco	12685	11949	12910	3920	1.02	252
5 Ethiopia	11789	11376	10462	2704	0.89	217
6 Algeria	10731	10387	10048	2286	0.94	235
7 Tunisia	10505	9835	11063	1996	1.05	257
8 Ghana	6596	6200	7070	1643	1.07	215
9 Kenya	5435	4932	5890	958	1.08	334
10 Uganda	3154	2934	3312	555	1.05	228

Figure 2: Scientific Production (Ten Best African Countries) on Scimago at the Year 2022

4. Journals

SCImago also gives the evolution of indexed journals of each country. This may be a good tool for leveling efforts of institutions and universities to get more visibility. The highest number (6727) belongs to US followed by UK (6570), Netherlands (2029), and Germany (1558) indexed journals. China is still at 851 indexed journals. It's very important to see AJOL hosting 676 Journals including 416 Open Access Journals. This platform already contains 18 057 Issues (223 492 Abstracts with 217 109 Full Text Articles. Africa

5. Conclusion

This study presents an overview of scientific production worldwide and in Africa, based on the SCImago ranking of institutions. Morocco has achieved significant improvements in its scientific output, ranking fourth in Africa. However, there are still opportunities for growth, particularly in terms of the number and quality of indexed journals, international collaboration and innovation potential. We recommend working to improve the publication and visibility of Moroccan institutions and researchers, notably by developing IMIST, supporting young researchers, promoting interdisciplinary research and encouraging partnerships with industry and society.

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