Elsevier data shows UK a world leader in sustainable development research

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UK above world average volume of research in 11 out of 16 of the United Nations' Sustainable Development Goals

UK producing more research that is more frequently cited than the US, China and Germany heavyweights

Less than one month from the UK hosting the UN Climate Change Conference (COP26), new data from **Elsevier**, a global leader in research publishing and information analytics, has revealed that the UK is a world leader in sustainable development research.

Elsevier analyzed more than 25.6m research papers published between 2012 and 2020, exploring the quantity and quality of research dedicated to the UN's 17 Sustainable Development Goals (SDGs).[1] While the UK outperformed many countries across the full suite of SDGs, it fell behind on some of the climate related SDGs—work that will be critical to the world finding lasting solutions to the climate crisis.

Lesley Thompson, PhD, Director of Academic & Government Strategic Alliance, Elsevier, said: "Ahead of the UK's moment on the center stage at COP26, it's encouraging to see the UK's research community leading the way in sustainable development. Research has a crucial role to play in finding solutions for many societal problems, from climate change to eliminating poverty.

"That said, there is a disconnect between the UK government's climate priorities and the research volume dedicated to these areas: to be globally competitive the UK needs to consider how it will increase support for research and innovation in affordable and clean energy, and responsible consumption and production, whether that be additional funding, higher prioritisation or a drive to attract new talent in these fields."

The analysis found that the UK exceeds the average output share of research among world-leading countries related to 11 out of 16 SDGs: No Poverty (1), Good Health and Well-Being (3), Quality Education (4), Gender Equality (5), Decent Work and Economic Growth (8), Industry, Innovation and Infrastructure (9), Reduced Inequalities (10), Climate Action (13), Life Below Water (14), Life On Land (15) and Peace, Justice and Strong Institutions (17).

However, the UK is lagging behind the average of world-leading countries in the volume of research related to several of the SDGs which also align with the UK Government's agendas focused on the growth of sustainable industries in the UK, including: Affordable and Clean Energy (7), Responsible Consumption and Production (12), Sustainable Cities and Communities (11), Clean Water and Sanitation (6), and Zero Hunger (2).
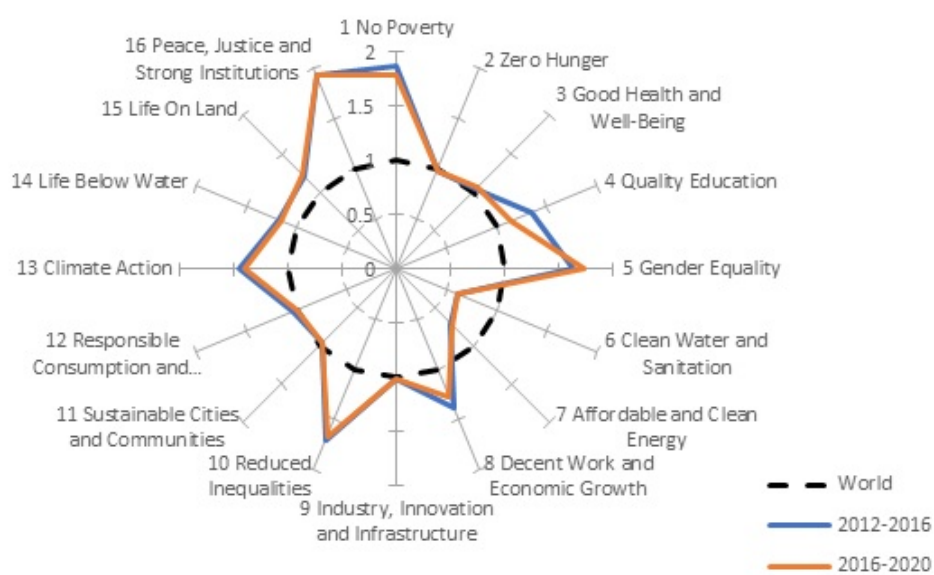

Figure 1, UK performance in terms of Relative Activity Index

The quality of the research produced in the UK relating to the UN's SDGs is world-leading across all 16 areas mapped. This feat was also achieved to a lesser degree by the USA, Italy and Germany as illustrated in the Appendix. China and India led the way in the volume of research in the fields of clean energy and water.

To determine the UK's performance against the average of eight world-leading countries (China, India, Japan, USA, France, Germany and Italy), each paper was analyzed and categorized in terms of subject focus and author location, before being mapped by Relative Activity Index (RAI) and Field Weighted Citation Index (FWIC)[2].
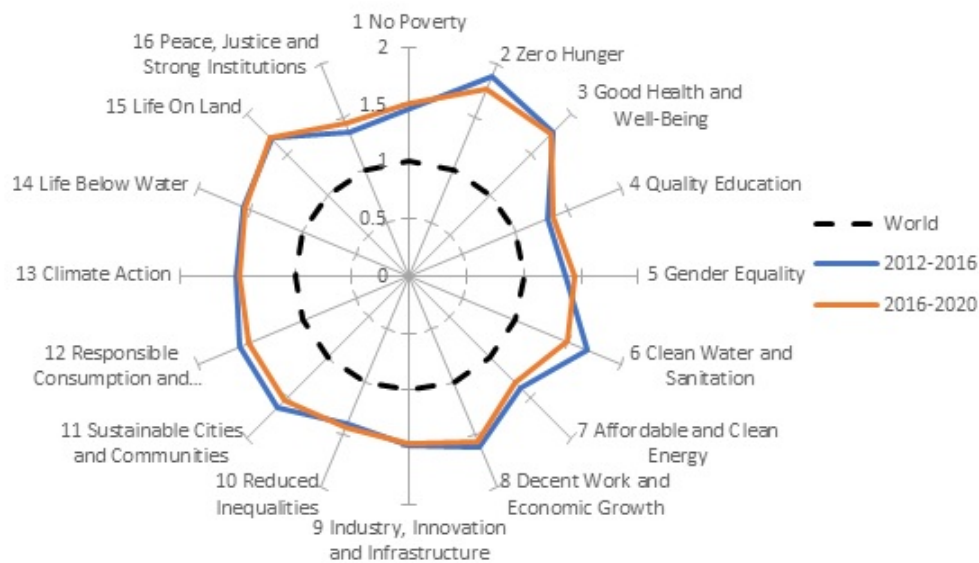
Figure 2, UK performance in terms of Field Weighted Citation Index

Last week also saw the launch of the Welsh Government Office for Science report "United Nations Sustainable Development Goals: Wales' Research Performance"

Kumsal Bayazit, Elsevier's CEO, speaking at the launch said: "We all know that the creation, sharing and application of new knowledge is vital to addressing the societal grand challenges. Targeted investment in research, development and innovation have repeatedly delivered solutions to grand challenges and positive impact on society. It is encouraging that the UK has an ambitious plan to continue to increase R&D investment as percent of the overall GDP."

Notes for editors

[1] The 17th UN Sustainable Development Goal, Partnerships for the Goals, targets collaboration and could not be assessed through publication analysis.

[2] Relative Activity Index (RAI) is defined as the share of a country's article output in a subject relative to the global share of articles in the same subject. A value of 1.0 indicates that a country's/an institute's research activity in a field corresponds exactly with the global activity in that field; a value higher than 1.0 implies a greater emphasis; and a value lower than 1.0 suggests a lesser focus.

Field Weighted Citation Index (FWCI) is an indicator of the citation impact of a publication. It is calculated by comparing the number of citations actually received by a publication with the number of citations expected for a publication of the same document type, publication year, and

subject. An FWCI of more than 1.00 indicates that the entity's publications have been cited more than would be expected based on the global average for similar publications; for example, a score of 2.11 means the entity's publications have been cited 111% more than the world average. An FWCI of less than 1.00 indicates that the entity's publications have been cited less than would be expected based on the global average for similar publications; for example, an FWCI score of 0.87 means the publications have been cited 13% less than the world average.

Main methodology

Since 2018, Elsevier has generated SDG search queries to help researchers and institutions track and demonstrate progress towards the targets of the United Nations Sustainable Development Goals (SDGs). In 2020, Elsevier, through its Science-Metrix group, taking the research community feedback into account, improved the search queries significantly. Those queries were then complemented by a machine learning model, which helped increase the number of papers identified for each SDG. As a result, this year's "Elsevier 2021 SDG mapping" captures on average twice as many articles as the 2020 version.

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