

State of scientific research in Finland Sustainable Development Goals in Finnish publishing



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State of scientific research in Finland

- Sustainable Development Goals



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- This report examines the UN Sustainable Development Goals (SDG) in scientific publishing in Finland.
- Main perspectives:
 - SDG topics in Finnish publications
 - SDG topics in publications by researchers and projects funded by the Research Council of Finland (AKA-funded publications)
 - Number of publications in SDG topics, scientific impact of SDG topics, share of SDG topics in publishing.



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UN Sustainable Development Goals



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The United Nations published the 17 Sustainable Development Goals in 2015. This report looks at the first 16.

- | | |
|--|--|
| 1. No poverty | 10. Reduced Inequalities |
| 2. Zero Hunger | 11. Sustainable Cities and Communities |
| 3. Good Health and Well-being | 12. Responsible Consumption and Production |
| 4. Quality Education | 13. Climate Action |
| 5. Gender Equality | 14. Life below Water |
| 6. Clean Water and Sanitation | 15. Life on Land |
| 7. Affordable and Clean Energy | 16. Peace, Justice and Strong Institutions |
| 8. Decent Work and Economic Growth | 17. Partnership between the Goals |
| 9. Industry, Innovation and Infrastructure | |



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Data and methods

- SDG-related publication sets were retrieved in April 2023 using the SDG classification available in the InCites Benchmarking & Analytics solution provided by Clarivate Analytics.
- SDG-related publication sets were sent to CSC – IT Center for Science Ltd for bibliometric analysis. CSC used the Web of Science database (incl. the Emerging Sources Citation Index) for analysis.
- Several publications belong to more than one SDG topic. These duplicates have been removed when total numbers of SDG publications for Finland and AKA are presented.
- Note: Clarivate updated the SDG classification on InCites B&A after the SDG-related publication sets were retrieved for this analysis. This means that a similar analysis now would result in different publications sets and results.
- For a more detailed description of data sources and bibliometric methods, see slides 18–24.



Results in brief

- Scientific impact of SDG-related Finnish publications is higher than that of Finnish publications on average.
- Largest SDG topic in Finnish publishing is Good health and Well-Being.
- Share of SDG-related publications in Finnish publishing has increased between 2011–2014 and 2018–2021.
- Same patterns apply to SDG-related publications by researchers and projects funded by the Research Council of Finland (AKA).
- Scientific impact of SDG-related publications by researchers and projects funded by AKA is higher than that of SDG-related Finnish publications on average.



Editors and bibliometric calculations

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- Bibliometric calculations
 - Yrjö Leino, CSC – IT Center for Science Ltd



SDG topics in Finnish publications



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Finnish publications related to SDG topics have a higher scientific impact than Finnish publications on average

Table 1. Number of publications (whole count) and Top 10 index of SDG topics in Finland in 2016-2019.

	Number of publications	Top 10 index
Finland SDG	37,289	1.30
Finland total	76,814	1.13

Source: Clarivate Analytics Web of Science based data, bibliometric computing by CSC Ltd, 2023.

Several publications belong to more than one SDG topic. These duplicates have been removed when total numbers of SDG publications are presented.

The top 10 index describes the proportion of the 10% most cited publications in the discipline. The world average in each discipline is 1. A top 10 index greater than 1 means that more than 10% of a country's/organisation's publications rank among the 10% most cited publications. The top 10 index is not calculated if the publication count is under 50 or if internal coverage is less than 40%. Internal coverage refers to the proportion of references in database publications that are also indexed in the database.

Good health and Well-being is the largest SDG topic in Finland

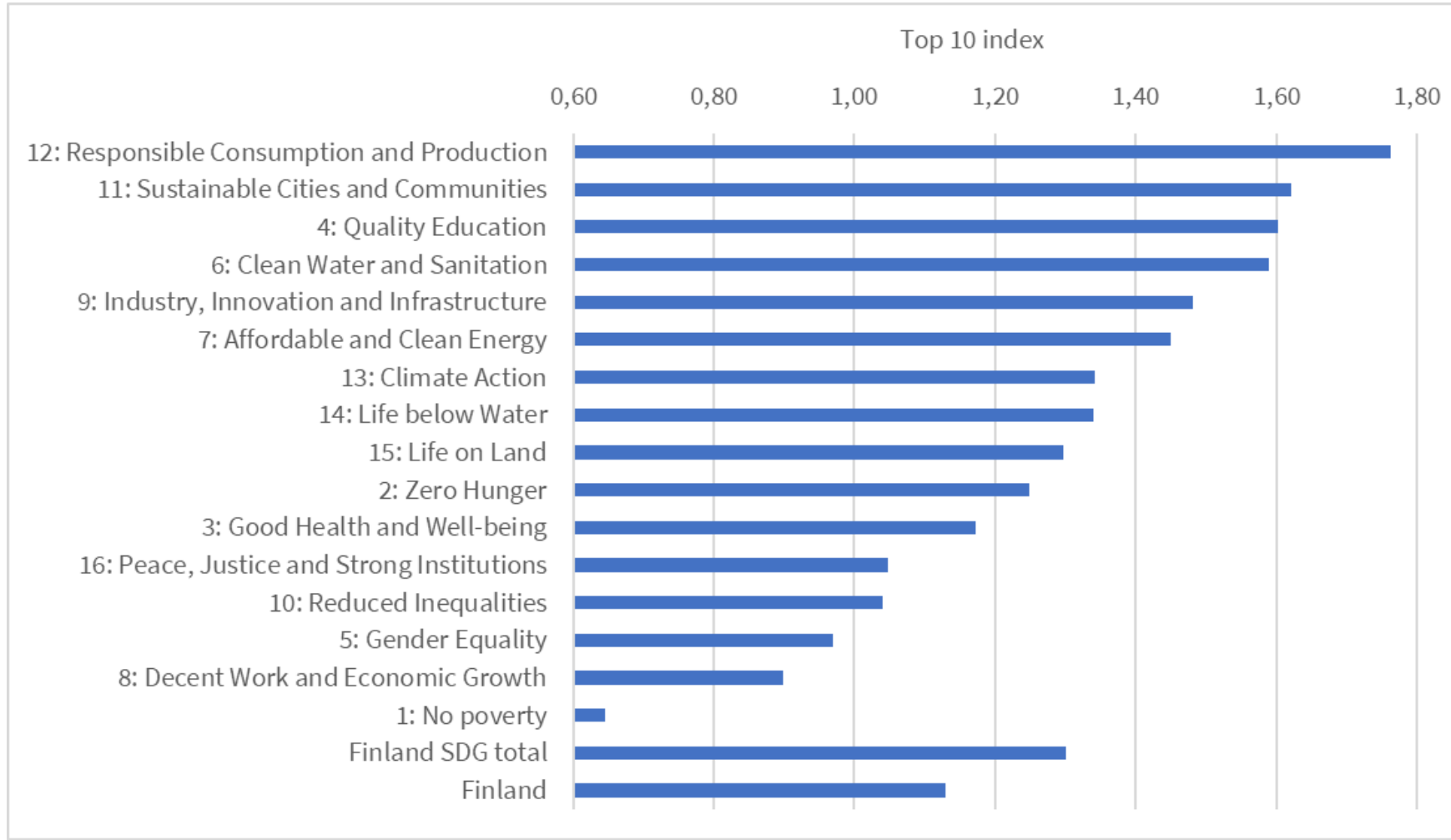
Table 2. Number of publications (whole count) in individual SDG topics in Finland in 2016–2019.

SDG topic	Number of publications	SDG topic	Number of publications
Good Health and Well-being	24,063	Quality Education	2,487
Climate Action	4,983	Clean Water and Sanitation	1,851
Life on Land	4,620	Zero Hunger	1,509
Sustainable Cities and Communities	4,336	Responsible Consumption and Production	1,065
Life below Water	4,277	Reduced Inequalities	1,043
Gender Equality	4,179	Decent Work and Economic Growth	398
Industry, Innovation and Infrastructure	2,919	Peace, Justice and Strong Institutions	294
Affordable and Clean Energy	2,507	No poverty	134

Source: Clarivate Analytics Web of Science based data, bibliometric computing by CSC Ltd, 2023.

Several publications belong to more than one SDG topic.

Finnish publications in most SDG topics have a higher scientific impact than Finnish publications on average



Source: Clarivate Analytics Web of Science based data, bibliometric computing by CSC Ltd, 2023.

The top 10 index describes the proportion of the 10% most cited publications in the discipline. The world average in each discipline is 1. A top 10 index greater than 1 means that more than 10% of a country's/organisation's publications rank among the 10% most cited publications. The top 10 index is not calculated if the publication count is under 50 or if internal coverage is less than 40%. Internal coverage refers to the proportion of references in database publications that are also indexed in the database.

Figure 3. Top 10 index of individual SDG topics in Finland in 2016-2019 (world average is 1). SDGs in descending order according to Top 10 index.

International collaboration increases scientific impact of Finnish SDG-related publications

Table 4. Number of publications (whole count) and Top 10 index in SDG topics by collaboration in Finland in 2016-2019.

	Number of publications	Top 10 index
International co-publications	22,563	1.76
Single-organisation publications	7,018	1.07
Domestic (Finnish) co-publications	7,708	1.01
Co-publications with (Finnish) companies	2,143	1.04

Source: Clarivate Analytics Web of Science based data, bibliometric computing by CSC Ltd, 2023.

Several publications belong to more than one SDG topic.

The top 10 index describes the proportion of the 10% most cited publications in the discipline. The world average in each discipline is 1. A top 10 index greater than 1 means that more than 10% of a country's/organisation's publications rank among the 10% most cited publications. The top 10 index is not calculated if the publication count is under 50 or if internal coverage is less than 40%. Internal coverage refers to the proportion of references in database publications that are also indexed in the database.

Share of SDG-related publications has increased in Finland

Table 5. Number of publications (whole count) in SDG topics and share (%) of SDG topics in total number of publications in Finland in 2011-2014 and 2018-2021.

	2011-2014	2018-2021
Number of Finnish SDG publications	27,387	39,954
Total number of Finnish publications	62,516	79,231
Share of SDG publications	44%	49%

Source: Clarivate Analytics Web of Science based data, bibliometric computing by CSC Ltd, 2023.

Several publications belong to more than one SDG topic. These duplicates have been removed when total numbers of SDG publications are presented.



SDG topics in AKA-funded publications



AKA-funded publications in SDG topics have a higher scientific impact than AKA-funded publications on average

Table 6. Number of AKA-funded publications (whole count) in SDG topics and their Top 10 index in 2016-2019.

	Number of publications	Top 10 index
AKA SDG	8,718	1.49
AKA total	18,640	1.30

Source: Clarivate Analytics Web of Science based data, bibliometric computing by CSC Ltd, 2023.

Several publications belong to more than one SDG topic. These duplicates have been removed when total numbers of SDG publications are presented.

The top 10 index describes the proportion of the 10% most cited publications in the discipline. The world average in each discipline is 1. A top 10 index greater than 1 means that more than 10% of a country's/organisation's publications rank among the 10% most cited publications. The top 10 index is not calculated if the publication count is under 50 or if internal coverage is less than 40%. Internal coverage refers to the proportion of references in database publications that are also indexed in the database.

Good health and Well-being is the largest SDG topic in AKA-funded publications

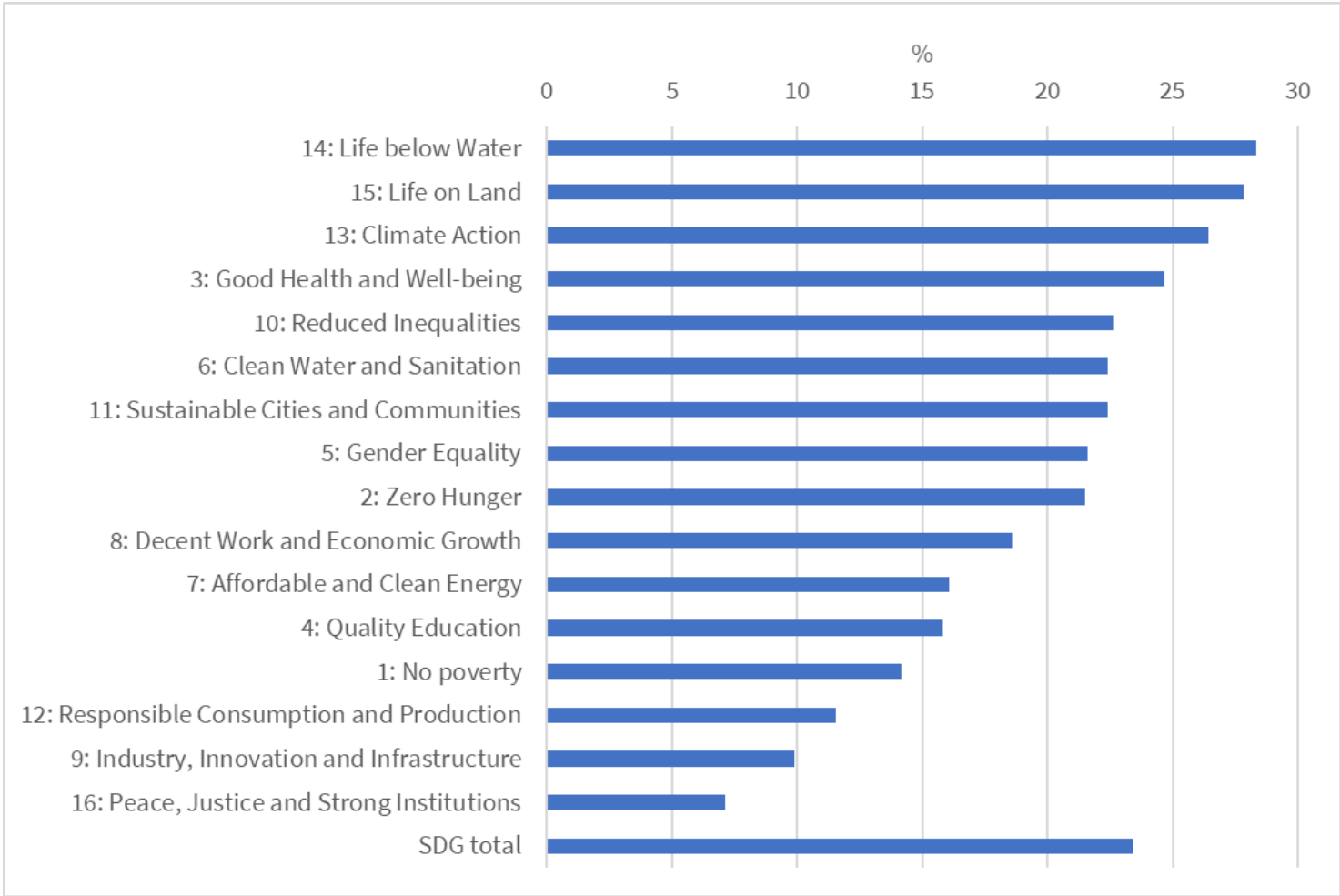
Table 7. Number of publications (whole count) in individual SDG topics in AKA-funded publications in 2016-2019.

SDG topic	Number of publications	SDG topic	Number of publications
Good Health and Well-being	5,936	Quality Education	393
Climate Action	1,316	Zero Hunger	324
Life on Land	1,285	Industry, Innovation and Infrastructure	288
Life below Water	1,212	Reduced Inequalities	236
Sustainable Cities and Communities	971	Responsible Consumption and Production	123
Gender Equality	902	Decent Work and Economic Growth	74
Clean Water and Sanitation	415	Peace, Justice and Strong Institutions	21
Affordable and Clean Energy	403	No poverty	19

Source: Clarivate Analytics Web of Science based data, bibliometric computing by CSC Ltd, 2023.

Several publications belong to more than one SDG topic.

Share of AKA-funded publications in Finland's SDG-related publications is 23% on average



Total number of SDG publications
(whole count) in 2016-2019:
AKA-funded: 8,718
Finland: 37,289

Source: Clarivate Analytics Web of Science
based data, bibliometric computing by CSC
Ltd, 2023.

Several publications belong to more than one SDG
topic. These duplicates have been removed when
total numbers of SDG publications are presented.

Figure 8. Share (%) of AKA-funded SDG publications in all Finnish SDG publications by topic in 2016-2019.

SDGs in descending order according to share of AKA-funded SDG publications.

Share of SDG topics has increased in AKA-funded publications

Table 9. Number of AKA-funded publications (whole count) in SDG topics and share (%) of SDG topics in total number of AKA-funded publications in 2011-2014 and 2018-2021.

	2011-2014	2018-2021
Number of AKA SDG publications	6,254	9,056
Total number of AKA publications	15,470	19,251
Share of SDG publications	42%	47%

Source: Clarivate Analytics Web of Science based data, bibliometric computing by CSC Ltd, 2023.

Several publications belong to more than one SDG topic. These duplicates have been removed when total numbers of SDG publications are presented.



Data and methods: further information



Data sources

- SDG-related publication sets were retrieved in April 2023 using the SDG classification available in the InCites Benchmarking & Analytics solution provided by Clarivate Analytics.
- Assignment of publications to SDGs on InCites B&A is based on the Micro Citation Topic classification. Selected Micro Topics and their associated publications are assigned to one or more SDGs. See further [information](#).
- SDG-related publication sets were sent to CSC – IT Center for Science Ltd for bibliometric analysis. CSC used the Web of Science database for the analysis.
- The following publication types were included in bibliometric calculations: article, review, letter, proceedings paper, book chapter and book.



Methods: co-publications



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- Co-authorship analyses make a distinction between
 - international co-publications: authors affiliated with organisations from at least two countries; here: Finland and at least one other country (based on authors' affiliation as reported in the publication and not, for instance, on nationality)
 - domestic co-publications: authors affiliated with at least two organisations from the same country (here: Finland), no authors from outside the country concerned
 - co-publications with companies: authors affiliated with at least one company and at least one organisation from another sector (here: all affiliations in Finland)
 - single-organisation publications: authors from one research organisation only (here: in Finland)



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Methods: top 10 index 1/2

- Index describes the proportion of the 10% most cited publications in the discipline.
- The average for each discipline is 1. An index value greater than 1 means that more than 10% of a country's/organisation's publications rank among the 10% most cited publications.
- When calculating the top 10 index, the number of citations to a publication is only compared to the number of citations to publications appearing in the same discipline in the same year.
- Self-citations are omitted from the analysis.
- The top 10 index is not calculated if the publication count is under 50 or if internal coverage is less than 40%. Internal coverage refers to the proportion of references in database publications that are also indexed in the database.



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Methods: top 10 index 2/2



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[concepts](#)

- Publications are fractionalised between fields of science, countries and organisations and in the case of Finland additionally between Finnish research organisations.
- If calculations are based on a small publication count, the top 10 index value can vary for random reasons. An examination of trends over several years will yield a more reliable picture of how the index has developed.
- The top 10 index describes the proportion of the 10% most cited publications in the discipline, and therefore the numbers and shares of all publications impact upon the index values. In comparisons of countries and organisations, variation in the top 10 indices especially for countries and organisations with large publication numbers impacts upon the index values for others.
- Citations are calculated using an open citation window from the year of publication until 2022.



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Limitations of the data and methods used

- Citation indicators such as the top 10 index offer only one perspective on scientific impact, but they do not in themselves provide a true overall impression of the standard of research.
- Peer reviews are a key mechanism for the evaluation of scientific quality.
- Publications in the humanities and many social sciences in particular are inadequately represented in international citation databases.
- Publications indexed in these databases alone do not provide an accurate picture of the true extent of publishing in these fields of science.



Bibliometric sources

Data source for publications related to SDG topics:

The results presented here are derived from InCites Benchmarking and Analysis[®] prepared by CLARIVATE ANALYTICS[®], Inc., Philadelphia, Pennsylvania, USA:
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Bibliometric computing:

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