

{water conservation} OR {water footprint} OR {water infrastructure} OR {water pollution} OR {water purification} OR {water use} OR {water uses} OR sanit* OR sewer*)) OR (({water} AND ({ecosystem} OR {eco-system}) AND ({protection of} OR {endocrine disruptor} OR {endocrine disruptors})) AND NOT {marine}) OR ({water} AND {water management} AND ({pollution remediation} OR {pollutant removal})) OR (({groundwater} OR {ground water} OR {ground-water}) AND {freshwater})) OR (({water pollution} OR {water pollutant}) AND ({waste water} AND "treatment") OR ({wastewater} AND "treatment")) OR {freshwater availability} OR {fresh water availability} OR {water scarcity} OR {open defecation} OR {blue water} OR {green water} OR {grey water} OR {black water})) AND NOT {global burden of disease study}) AND PUBYEAR < 2018 AND PUBYEAR > 2012

Process:

The first stage of this review was to compare the original V1 search string to the targets listed under the Sustainable Development Goal (SDG).

SDG targets listed here: <https://sustainabledevelopment.un.org/sdg6>

The purpose of this stage was to understand whether the Scopus results correctly reflected the theme of the SDG. The SDGs were unanimously agreed by member states of the United Nations, with very deliberate language and scope/ exclusions, so the results of this analysis should accurately reflect the specific SDG themes.

The SDG targets showed that the goal relates to access to safe water and sanitation and the effective management of the resources. The targets do cover water quality, but this relates to pollution and contaminants rather than to waterborne diseases.

A Scopus search (V1) was conducted using the original search string. This returned 308,544 document results.

The top 20 cited articles were reviewed.

15 of the 20 articles did not closely reflect the theme of the SDG. Specifically, many of the most-cited articles were medical studies or research relating to disease.

Top 20 most cited articles listed in Scopus from the original search string:

*red text shows articles which do not closely match the theme of the SDG

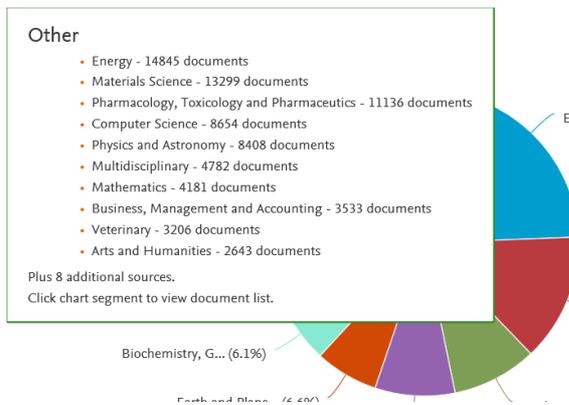
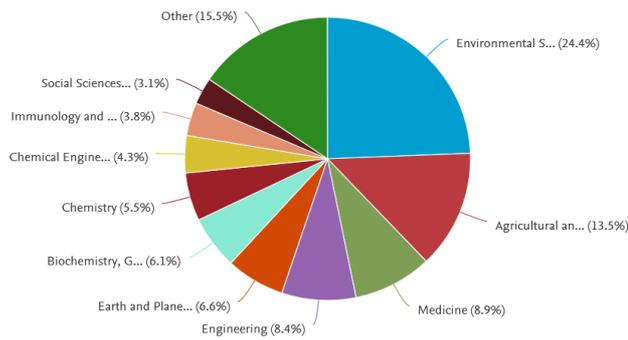
Title	Year	Source title	Cited by
Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	3169
The global distribution and burden of dengue	2013	Nature	3156
Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	2329
Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015	2016	The Lancet	1587

Polydopamine and its derivative materials: Synthesis and promising applications in energy, environmental, and biomedical fields	2014	Chemical Reviews	1543
Graphitic Carbon Nitride (g-C ₃ N ₄)-Based Photocatalysts for Artificial Photosynthesis and Environmental Remediation: Are We a Step Closer to Achieving Sustainability?	2016	Chemical Reviews	1477
Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015	2016	The Lancet	1450
Karst Hydrogeology and Geomorphology	2013	Karst Hydrogeology and Geomorphology	1332
Polymeric Photocatalysts Based on Graphitic Carbon Nitride	2015	Advanced Materials	1241
Antibiotic resistance-the need for global solutions	2013	The Lancet Infectious Diseases	1192
Biochar as a sorbent for contaminant management in soil and water: A review	2014	Chemosphere	1106
Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	1079
Global, regional, and national causes of child mortality in 2000-13, with projections to inform post-2015 priorities: An updated systematic analysis	2015	The Lancet	1076
A review on the occurrence of micropollutants in the aquatic environment and their fate and removal during wastewater treatment	2014	Science of the Total Environment	1066
Treatment and prognostic factors for long-term outcome in patients with anti-NMDA receptor encephalitis: An observational cohort study	2013	The Lancet Neurology	1026
Natural products: A continuing source of novel drug leads	2013	Biochimica et Biophysica Acta - General Subjects	995
Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015	2016	The Lancet	923
The NCEP climate forecast system version 2	2014	Journal of Climate	891
Spread of artemisinin resistance in Plasmodium falciparum malaria	2014	New England Journal of Medicine	872
All-solid-state Z-scheme photocatalytic systems	2014	Advanced Materials	864

Looking at the subject areas covered by the results shows that the third largest subject area (excluding 'other') was medicine – a reflection of the high number of medical studies in the results.

The 'other' category was significant, covering areas such as Astronomy and Physics. Mathematics and Veterinary. These areas are not relevant to the SDG.

Documents by subject area



The indexed keywords, for each of the irrelevant articles, were used to identify which search terms were returning the irrelevant results.

It was found that some search terms were too general and returned a large number of articles which did not closely match the theme of the SDG. For example, “Cholera” or “Malaria” returned many medical studies. These articles are certainly relevant to the SDG in a broad context – cholera is indeed linked to safe water access – however the SDG focuses on the water resource (as identified in the earlier SDG target review), rather than waterborne diseases.

Indexed keywords shown in Scopus with the search terms highlighted:

Indexed keywords

[Authors >](#) [Keywords >](#)

EMTREE medical terms:

Afghanistan Africa south of the Sahara African trypanosomiasis Albania alcohol use disorder algorithm
Alzheimer disease Angola appendicitis Argentina Armenia Article automutilation autopsy
Azerbaijan bacterial arthritis Bahamas Bahrain Bangladesh Barbados Belize Bolivia
Botswana brain disease Brazil breast cancer Bulgaria Cambodia Cameroon Canada
cancer incidence Cape Verde cardiovascular disease cause of death cause of death ensemble modelling
cerebrovascular accident childhood mortality China cholera chronic kidney disease
chronic obstructive lung disease chronic osteomyelitis Clostridium infection Colombia colorectal cancer
Comoros congenital malformation congenital syphilis Congo Costa Rica Cote d'Ivoire Croatia
cryptosporidiosis Cuba diabetes mellitus diarrhea disease surveillance drowning Ecuador
El Salvador Equatorial Guinea Eritrea Ethiopia Finland foreign body Gabon Gambia Grenada
groups by age Guatemala Guinea-Bissau Guyana Haemophilus influenzae type b Haiti
heart atrium fibrillation hemoglobinopathy hemolytic anemia hepatitis C history Hodgkin disease
Honduras human Human immunodeficiency virus infection Hungary ICD-10 ICD-9 India
Indonesia information processing ischemic heart disease Israel Jamaica Japan jaundice
Kazakhstan Kenya Kyrgyzstan Laos Latvia life expectancy life table liver cancer liver cirrhosis
lower respiratory tract infection lung cancer lupus erythematosus Madagascar malaria Malaysia
Mali maternal mortality Mauritania Mauritius measles meningitis mesothelioma Mexico
Mongolia Montenegro (republic) mortality Mozambique musculoskeletal disease Myanmar
natural disaster neoplasm newborn disease newborn jaundice Nicaragua Nigeria North Korea
Norway nutritional deficiency nutritional disorder Oman Pakistan pancreas cancer
Papua New Guinea Paraguay paratyphoid fever Parkinson disease peptic ulcer perinatal asphyxia
peripheral vascular disease pertussis Peru Philippines pneumonia Poland premature labor
priority journal pulmonary aspiration respiratory syncytial virus infection rheumatic heart disease Romania

The search keywords were edited to remove the broader search terms, or to make them more specific by combining with other search keywords.

Version 1 original search string: 308,544 document results

TITLE-ABS-KEY(((water availability) OR {water supply} OR {water supplies} OR {clean water} OR {hygienic toilet} OR {hygienic toilets} OR {antifouling membrane} OR {antifouling membranes} OR {anti-fouling membrane} OR {anti-fouling membranes} OR {drinking water} OR {water management} OR {water quality} OR {water security} OR {water shortage} OR {waste water} OR wastewater OR {water conservation} OR {water footprint} OR {water infrastructure} OR {water pollution} OR {water purification} OR {water resource} OR {water resources} OR {water use} OR {water uses} OR (water AND ecosystem*) OR (water AND eco-system*) OR freshwater OR sanit* OR sewer* OR defecat* OR {water-borne disease} OR {water-borne diseases} OR {water borne disease} OR {water borne diseases} OR cholera OR dysentery OR typhoid OR malaria OR bilharzia OR {water contamination} OR {water contaminant} OR {water contaminants} OR (water AND ({endocrine disruptor} OR {endocrine disruptors})) OR {aquatic toxicology} OR {water toxicology} OR {aquatic ecotoxicology} OR {water ecotoxicology} OR {water scarcity} OR {blue water} OR {green water} OR {grey water} OR {black water} OR (water AND (microplastic* OR micro-plastic*)) OR sanitation)) AND PUBYEAR BEF 2018 AND PUBYEAR AFT 2012

Specific query terms from the above query (as listed below) were queried in Scopus using the filter AND PUBYEAR < 2018 AND PUBYEAR > 2012.

To assess the old query terms, the top 20 cited articles were reviewed to assess what types of publications are being retrieved by the query.

To assess the new query terms, the top 20 cited articles were reviewed to assess what types of publications are being retrieved by the query.

Rationale for edits to the V1 search keywords:

<u>query term</u>	<u>decision</u>	<u>rationale</u>
defecat*	Changed to {open defecation}	Defecat was returning a lot of veterinary research
{drinking water}	Changed to {safe} AND {drinking water}	{drinking water} was returning a lot of medical research describing how medicine was administered
cholera	Deleted	SDG6 is not about the illnesses associated with water. These were returning studies on the illness.
dysentery	Deleted	SDG6 is not about the illnesses associated with water. These were returning studies on the illness.
typhoid	Deleted	SDG6 is not about the illnesses associated with water. These were returning studies on the illness.
malaria	Deleted	SDG6 is not about the illnesses associated with water. These were returning studies on the illness.
bilharzia	Deleted	SDG6 is not about the illnesses associated with water. These were returning studies on the illness.
(water AND eco-system*)	Changed to (water AND eco-system* and {protection of})	This was returning studies on ecosystems rather than protection of ecosystems, which is the focus of the SDG
wastewater	Deleted	Finding many studies about industrial processes rather than water
{waste water}	Changed to {waste water and treatment}	To find publications which discuss treating the waste water rather than mentioning waste water (such as in manufacturing processes, etc.)
freshwater	Changed to {freshwater availability}	There were unrelated studies about glacial melt etc. Availability helps to restrict this to water resources.
{water quality}	Changed to ({water quality} AND (pollutant or pollution))	It was finding publications about the water quality in processes such as power plants.
(water AND (microplastic* OR micro-plastic*))	Deleted	The research was relating to sea life which is a different SDG.
OR {water-borne disease} OR {water-borne diseases} OR {water borne disease} OR {water borne diseases}	Deleted	This returned many medical studies which were not related to the SDG.
OR {water contamination} OR {water contaminant} OR {water contaminants}	Deleted	These were too general, but were replaced with a {freshwater} AND...

Version 2 search string (first update): 29,626 document results

TITLE-ABS-KEY (((({Safe} AND ({water access} OR {drinking water})) OR ({clean} AND ({drinking water} OR {water source})) OR ({water} AND ({sanitation and hygiene} OR {sanitation & hygiene} OR {quality} OR {resource})) AND ({water availability} OR {water-use

efficiency} OR {water supply} OR {water supplies} OR {clean water} OR {hygienic toilet} OR {hygienic toilets} OR {antifouling membrane} OR {antifouling membranes} OR {anti-fouling membrane} OR {anti-fouling membranes} OR {water management} OR {aquatic toxicology} OR {water toxicology} OR {aquatic ecotoxicology} OR {water ecotoxicology})) OR (({freshwater} OR {fresh water}) AND ({water quality} OR {wastewater} OR {waste water}) AND ({pollutant} OR {pollution})) OR ({freshwater} AND ({water security} OR {water shortage} OR {waste water treatment} OR {wastewater treatment} OR {water conservation} OR {water footprint} OR {water infrastructure} OR {water pollution} OR {water purification} OR {water use} OR {water uses} OR sanit* OR sewer*)) OR (({water} AND ({ecosystem} OR {eco-system}) AND ({protection of} OR {endocrine disruptor} OR {endocrine disruptors})) AND NOT {marine}) OR {freshwater availability} OR {fresh water availability} OR {water scarcity} OR {open defecation} OR {blue water} OR {green water} OR {grey water} OR {black water})) AND NOT {global burden of disease study}) AND PUBYEAR < 2018 AND PUBYEAR > 2012

The results of the V2 search were reviewed to check whether they aligned closely with the SDG theme.

The updated search returned 29,626 document results, compared to 308,544 document results for the original search.

The top 20 cited articles were reviewed. 2 of the 20 articles did not closely reflect the theme of the SDG, compared to 15/ 20 in the original search. These 2 articles were included in the results through search terms such as “water scarcity” and “water resource”. However, removing these terms from the search string would exclude relevant articles.

Top 20 most cited articles listed in Scopus from the V2 search string:

*red text shows articles which do not closely match the theme of the SDG

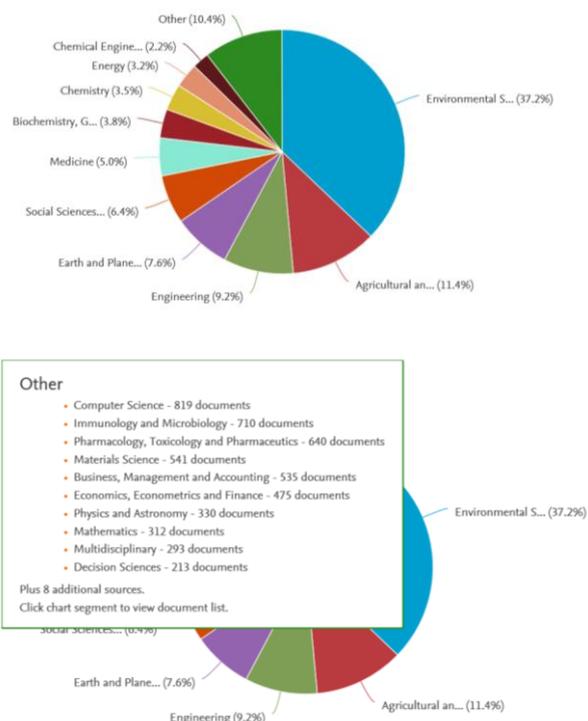
Title	Year	Source title	Cited by
Karst Hydrogeology and Geomorphology	2013	Karst Hydrogeology and Geomorphology	1332
Applications of nanotechnology in water and wastewater treatment	2013	Water Research	805
Organic and inorganic contaminants removal from water with biochar, a renewable, low cost and sustainable adsorbent - A critical review	2014	Bioresource Technology	723
Impact of shale gas development on regional water quality	2013	Science	696
Ultrathin graphene nanofiltration membrane for water purification	2013	Advanced Functional Materials	618
A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States	2014	Environmental Science and Technology	590
The contentious nature of soil organic matter	2015	Nature	559
Multimodel assessment of water scarcity under climate change	2014	Proceedings of the National Academy of Sciences of the United States of America	507
Materials for next-generation desalination and water purification membranes	2016	Nature Reviews Materials	460
Yield gap analysis with local to global relevance-A review	2013	Field Crops Research	457

Sorption of pollutants by porous carbon, carbon nanotubes and fullerene- An overview	2013	Environmental Science and Pollution Research	454
Health and climate change: Policy responses to protect public health	2015	The Lancet	433
Heihe watershed allied telemetry experimental research (HiWater) scientific objectives and experimental design	2013	Bulletin of the American Meteorological Society	432
Sustainability: Four billion people facing severe water scarcity	2016	Science Advances	431
The Millennium Drought in southeast Australia (2001-2009): Natural and human causes and implications for water resources, ecosystems, economy, and society	2013	Water Resources Research	421
Rapid removal of organic micropollutants from water by a porous β -cyclodextrin polymer	2016	Nature	416
Terrestrial water fluxes dominated by transpiration	2013	Nature	399
Microplastics in freshwater systems: A review of the emerging threats, identification of knowledge gaps and prioritisation of research needs	2015	Water Research	361
Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation-Lancet Commission on planetary health	2015	The Lancet	358
Groundwater arsenic contamination throughout China	2013	Science	347

The subject areas covered by the V2 search results:

Note that representation of the subject “Medicine” are now fewer and “Environmental Science” is higher, as expected.

Scopus subject areas of the V2 search:



The V2 search results were compared to the V1 search results to check if the V2 search was primarily removing irrelevant results.

The V1 and V2 searches were combined using AND NOT function in Scopus. This returned 279,325 document results.

16 of the top 20 cited articles in this new search (articles in V1 search, which are not present in the V2 search) were found to be irrelevant for the SDG.

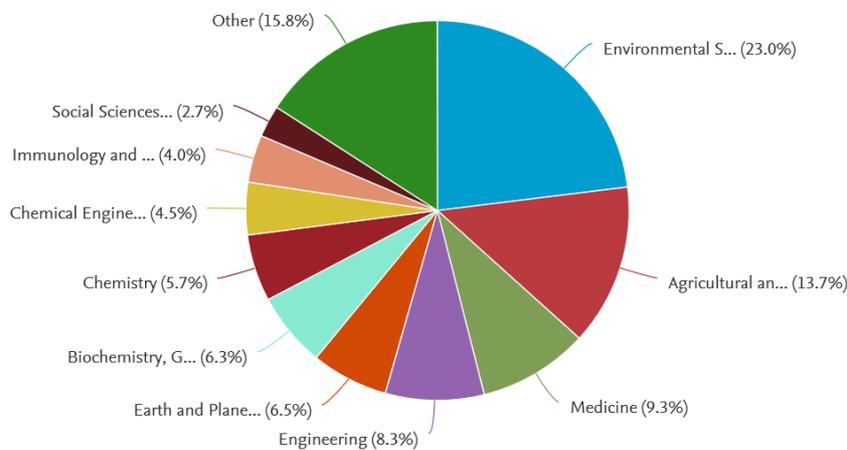
Top 20 cited articles included in the original search results but not in the updated search results:

*red text shows articles which do not closely match the theme of the SDG

Title	Year	Source title	Cited by
Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	3170
The global distribution and burden of dengue	2013	Nature	3157
Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	2330
Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015	2016	The Lancet	1587
Polydopamine and its derivative materials: Synthesis and promising applications in energy, environmental, and biomedical fields	2014	Chemical Reviews	1544
Graphitic Carbon Nitride (g-C ₃ N ₄)-Based Photocatalysts for Artificial Photosynthesis and Environmental Remediation: Are We a Step Closer to Achieving Sustainability?	2016	Chemical Reviews	1477
Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015	2016	The Lancet	1452
Polymeric Photocatalysts Based on Graphitic Carbon Nitride	2015	Advanced Materials	1241
Antibiotic resistance-the need for global solutions	2013	The Lancet Infectious Diseases	1193
Biochar as a sorbent for contaminant management in soil and water: A review	2014	Chemosphere	1107
Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	1079
Global, regional, and national causes of child mortality in 2000-13, with projections to inform post-2015 priorities: An updated systematic analysis	2015	The Lancet	1076
A review on the occurrence of micropollutants in the aquatic environment and their fate and removal during wastewater treatment	2014	Science of the Total Environment	1066
Treatment and prognostic factors for long-term outcome in patients with anti-NMDA receptor encephalitis: An observational cohort study	2013	The Lancet Neurology	1027
Natural products: A continuing source of novel drug leads	2013	Biochimica et Biophysica	996

		Acta - General Subjects	
Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015	2016	The Lancet	923
The NCEP climate forecast system version 2	2014	Journal of Climate	891
Spread of artemisinin resistance in Plasmodium falciparum malaria	2014	New England Journal of Medicine	872
All-solid-state Z-scheme photocatalytic systems	2014	Advanced Materials	864
Defaunation in the Anthropocene	2014	Science	824

When looking at the subject areas, the excluded Environmental Science articles seemed rather large.



Many of these articles related to:

- Water pollution and the treatment processes of waste water. The articles did not discuss the impacts on the ecosystem, rather industrial processes and results. These articles are relevant to the SDG as they detail water pollution prevention
- Groundwater. These articles are related to the SDG as this is a water resource

A second update was made to the search string to cover topics such as groundwater.

To bring these articles into the search results, the following were added to the search string:

- OR ({water} AND {water management} AND (({pollution remediation} OR {pollutant removal})))
* "water management" was included to restrict the results to articles referencing application of pollution remediation, rather than chemical studies which were not specifically related to the management of water resources
- OR ((({water pollution} OR {water pollutant}) AND (({waste water treatment} OR {wastewater treatment}))))
- OR ((({groundwater} OR {ground water} OR {ground-water}) AND {freshwater}))

Version 3 update search: 37,241 document results

TITLE-ABS-KEY (((({Safe} AND ({water access} OR {drinking water})) OR ({clean} AND ({drinking water} OR {water source})) OR ({water} AND ({sanitation and hygiene} OR {sanitation & hygiene} OR {quality} OR {resource}) AND ({water availability} OR {water-use efficiency} OR {water supply} OR {water supplies} OR {clean water} OR {hygienic toilet} OR {hygienic toilets} OR {antifouling membrane} OR {antifouling membranes} OR {anti-fouling membrane} OR {anti-fouling membranes} OR {water management} OR {aquatic toxicology} OR {water toxicology} OR {aquatic ecotoxicology} OR {water ecotoxicology})) OR (({freshwater} OR {fresh water}) AND ({water quality}) AND ({pollutant} OR {pollution})) OR ({freshwater} AND ({water security} OR {water shortage} OR {waste water treatment} OR {wastewater treatment} OR {water conservation} OR {water footprint} OR {water infrastructure} OR {water pollution} OR {water purification} OR {water use} OR {water uses} OR sanit* OR sewer*)) OR (({water} AND ({ecosystem} OR {eco-system}) AND ({protection of} OR {endocrine disruptor} OR {endocrine disruptors})) AND NOT {marine}) OR ({water} AND {water management} AND ({pollution remediation} OR {pollutant removal})) OR (({groundwater} OR {ground water} OR {ground-water}) AND {freshwater}) OR (({water pollution} OR {water pollutant}) AND ({waste water treatment} OR {wastewater treatment}))) OR {freshwater availability} OR {fresh water availability} OR {water scarcity} OR {open defecation} OR {blue water} OR {green water} OR {grey water} OR {black water})) AND NOT {global burden of disease study}) AND PUBYEAR < 2018 AND PUBYEAR > 2012

2 of the top 20 most-cited articles were not relevant to the SDG.

Top 20 cited articles included in the V3 search results:

*red text shows articles which do not closely match the theme of the SDG

Title	Year	Source title	Cited by
Karst Hydrogeology and Geomorphology	2013	Karst Hydrogeology and Geomorphology	1333
Biochar as a sorbent for contaminant management in soil and water: A review	2014	Chemosphere	1110
A review on the occurrence of micropollutants in the aquatic environment and their fate and removal during wastewater treatment	2014	Science of the Total Environment	1068
Applications of nanotechnology in water and wastewater treatment	2013	Water Research	806
Comprehensive evaluation of antibiotics emission and fate in the river basins of China: Source analysis, multimedia modeling, and linkage to bacterial resistance	2015	Environmental Science and Technology	745
Organic and inorganic contaminants removal from water with biochar, a renewable, low cost and sustainable adsorbent - A critical review	2014	Bioresource Technology	724
Impact of shale gas development on regional water quality	2013	Science	697
Urban wastewater treatment plants as hotspots for the release of antibiotics in the environment: A review	2013	Water Research	661
A review on emerging contaminants in wastewaters and the environment: Current knowledge, understudied areas and recommendations for future monitoring	2014	Water Research	645
Ultrathin graphene nanofiltration membrane for water purification	2013	Advanced Functional Materials	620

Biomimetic super-lyophobic and super-lyophilic materials applied for oil/water separation: A new strategy beyond nature	2015	Chemical Society Reviews	593
A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States	2014	Environmental Science and Technology	592
Advanced oxidation processes in water/wastewater treatment: Principles and applications. A review	2014	Critical Reviews in Environmental Science and Technology	570
The use of zero-valent iron for groundwater remediation and wastewater treatment: A review	2014	Journal of Hazardous Materials	566
The contentious nature of soil organic matter	2015	Nature	559
Recent developments of zinc oxide based photocatalyst in water treatment technology: A review	2016	Water Research	541
Full-scale partial nitrification/anammox experiences - An application survey	2014	Water Research	537
Multimodel assessment of water scarcity under climate change	2014	Proceedings of the National Academy of Sciences of the United States of America	507
Materials for next-generation desalination and water purification membranes	2016	Nature Reviews Materials	462
Yield gap analysis with local to global relevance-A review	2013	Field Crops Research	458

The V3 search results were compared to the V1 search results to check the second updated search was primarily removing irrelevant results.

Combining the V3 search with the V1 search using AND NOT function in Scopus resulted in 271,377 document results.

19 of the top 20 most-cited articles (articles present in the V1 search results but not in the V3 search results) were irrelevant for the SDG.

Top 20 cited articles included in the V1 search results but not in the V3 search results:

*red text shows articles which do not closely match the theme of the SDG

Title	Year	Source title	Cited by
Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	3172
The global distribution and burden of dengue	2013	Nature	3159
Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	2331
Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249	2016	The Lancet	1588

causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015			
Polydopamine and its derivative materials: Synthesis and promising applications in energy, environmental, and biomedical fields	2014	Chemical Reviews	1546
Graphitic Carbon Nitride (g-C ₃ N ₄)-Based Photocatalysts for Artificial Photosynthesis and Environmental Remediation: Are We a Step Closer to Achieving Sustainability?	2016	Chemical Reviews	1479
Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015	2016	The Lancet	1454
Polymeric Photocatalysts Based on Graphitic Carbon Nitride	2015	Advanced Materials	1242
Antibiotic resistance-the need for global solutions	2013	The Lancet Infectious Diseases	1194
Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	1080
Global, regional, and national causes of child mortality in 2000-13, with projections to inform post-2015 priorities: An updated systematic analysis	2015	The Lancet	1076
Treatment and prognostic factors for long-term outcome in patients with anti-NMDA receptor encephalitis: An observational cohort study	2013	The Lancet Neurology	1027
Natural products: A continuing source of novel drug leads	2013	Biochimica et Biophysica Acta - General Subjects	996
Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015	2016	The Lancet	923
The NCEP climate forecast system version 2	2014	Journal of Climate	892
Spread of artemisinin resistance in Plasmodium falciparum malaria	2014	New England Journal of Medicine	872
All-solid-state Z-scheme photocatalytic systems	2014	Advanced Materials	864
Defaunation in the Anthropocene	2014	Science	825
Impacts of ocean acidification on marine organisms: Quantifying sensitivities and interaction with warming	2013	Global Change Biology	819
Injection-induced earthquakes	2013	Science	818

The top 20 cited articles remained relevant to the SDG.

This search (V4) was compared to V3 with an “AND NOT” to show which articles had been added to the search results. Of the top 20 most cited articles (which are present in V4 search, but not in the V3 search), only one was not relevant to the SDG.

Title	Year	Source title	Cited by
Photocatalytic organic pollutants degradation in metal-organic frameworks	2014	Energy and Environmental Science	592
CuO nanostructures: Synthesis, characterization, growth mechanisms, fundamental properties, and applications	2014	Progress in Materials Science	503
Environmental Remediation and Application of Nanoscale Zero-Valent Iron and Its Composites for the Removal of Heavy Metal Ions: A Review	2016	Environmental Science and Technology	316
Fe ₃ O ₄ /cyclodextrin polymer nanocomposites for selective heavy metals removal from industrial wastewater	2013	Carbohydrate Polymers	290
Research progress of perovskite materials in photocatalysis- and photovoltaics-related energy conversion and environmental treatment	2015	Chemical Society Reviews	275
Extracellular polymeric substances of bacteria and their potential environmental applications	2014	Journal of Environmental Management	227
Recent advances in the use of graphene-family nanoadsorbents for removal of toxic pollutants from wastewater	2014	Advances in Colloid and Interface Science	207
Occurrence and removal of organic micropollutants: An overview of the watch list of EU Decision 2015/495	2016	Water Research	188
Catalytic nanomotors for environmental monitoring and water remediation	2014	Nanoscale	167
Microbial electrolysis cells turning to be versatile technology: Recent advances and future challenges	2014	Water Research	146
Bioelectrochemical metal recovery from wastewater: A review	2014	Water Research	140
Sulfate radicals induced from peroxymonosulfate by cobalt manganese oxides (Co _x Mn _{3-x} O ₄) for Fenton-Like reaction in water	2015	Journal of Hazardous Materials	131
The potential role of biochar in the removal of organic and microbial contaminants from potable and reuse water: A review	2015	Chemosphere	129
Accelerated reduction of chlorinated nitroaromatic antibiotic chloramphenicol by biocathode	2013	Environmental Science and Technology	126
Progress in the preparation and application of modified biochar for improved contaminant removal from water and wastewater	2016	Bioresource Technology	120
Oil/water separation techniques: A review of recent progresses and future directions	2017	Journal of Materials Chemistry A	119
Novel fluorinated Bi ₂ MoO ₆ nanocrystals for efficient photocatalytic removal of water organic pollutants under different light source illumination	2017	Applied Catalysis B: Environmental	116
Prediction of concentration levels of metformin and other high consumption pharmaceuticals in wastewater and regional surface water based on sales data	2013	Science of the Total Environment	112

Biochar as potential sustainable precursors for activated carbon production: Multiple applications in environmental protection and energy storage	2017	Bioresource Technology	111
Manganese dioxide/iron oxide/acid oxidized multi-walled carbon nanotube magnetic nanocomposite for enhanced hexavalent chromium removal	2013	Chemical Engineering Journal	109

Another search term which was found to be too restrictive was:

- ({water quality} AND (pollutant or pollution))

Other terms, in addition to pollution, were investigated using the indexed keywords in other results and in a far more general search on Water AND pollution.

The indexed keywords showed that pollution or pollutant was common in the articles relevant to the SDG. Other terms identified included:

Other terms identified	Rationale for Inclusion in search?
Chemical names and formulae (such as arsenic, Cu, lithium, etc.)	These were not included in the search as there are too many to include them all in the search. Including only some of them could skew the results. Testing on several chemical names showed that an article would typically include the term "pollution" or "pollutant" if it was in relation to water resources and the SDG. NOT ADDED TO THE SEARCH
Contaminant and contamination	These terms appear in many articles with the term "water" which are not relevant to the SDG (articles such as the quality of water in chemical reactions, or as part of industrial processes). However, these terms do appear frequently in articles relevant to the SDG. The term Contamina* was added to the search with freshwater and water quality which restricted the results to articles relating to water resources. ADDED TO THE SEARCH
Micropollutants	These are already found in the search by 'pollutant'. NOT ADDED TO THE SEARCH

Version 5: 38,898 document results

TITLE-ABS-KEY (((({Safe} AND ({water access} OR {drinking water})) OR ({clean} AND ({drinking water} OR {water source})) OR ({water} AND ({sanitation and hygiene} OR {sanitation & hygiene} OR {quality} OR {resource}) AND ({water availability} OR {water-use efficiency} OR {water supply} OR {water supplies} OR {clean water} OR {hygienic toilet} OR {hygienic toilets} OR {antifouling membrane} OR {antifouling membranes} OR {anti-fouling membrane} OR {anti-fouling membranes} OR {water management} OR {aquatic toxicology} OR {water toxicology} OR {aquatic ecotoxicology} OR {water ecotoxicology})) OR (({freshwater} OR {fresh water}) AND ({water quality}) AND ({pollutant} OR {pollution} OR {contaminant} OR ({freshwater} AND ({water security} OR {water shortage} OR ({waste water} AND "treatment") OR ({wastewater} AND "treatment") OR {water conservation} OR {water footprint} OR {water infrastructure} OR {water pollution} OR {water purification} OR {water use} OR {water uses} OR sanit* OR sewer*)) OR (({water} AND ({ecosystem} OR {eco-system}) AND ({protection of} OR {endocrine disruptor} OR {endocrine disruptors})) AND NOT {marine}) OR ({water} AND {water management} AND ({pollution remediation} OR {pollutant removal}))) OR (({groundwater} OR {ground water} OR {ground-water}) AND {freshwater})) OR (({water pollution} OR {water pollutant}) AND ({waste water} AND "treatment") OR ({wastewater} AND "treatment")) OR {freshwater availability} OR {fresh water availability} OR {water scarcity} OR {open defecation} OR {blue water} OR {green water} OR {grey water} OR {black water})) AND NOT {global burden of disease study}) AND PUBYEAR < 2018 AND PUBYEAR > 2012

The top 20 most cited articles changed little from previous searches. One of the articles is not relevant to the SDG (this is the same as in the V3 search).

Title	Year	Source title	Cited by
Karst Hydrogeology and Geomorphology	2013	Karst Hydrogeology and Geomorphology	1343
Biochar as a sorbent for contaminant management in soil and water: A review	2014	Chemosphere	1126
A review on the occurrence of micropollutants in the aquatic environment and their fate and removal during wastewater treatment	2014	Science of the Total Environment	1086
Applications of nanotechnology in water and wastewater treatment	2013	Water Research	811
Comprehensive evaluation of antibiotics emission and fate in the river basins of China: Source analysis, multimedia modeling, and linkage to bacterial resistance	2015	Environmental Science and Technology	750
Organic and inorganic contaminants removal from water with biochar, a renewable, low cost and sustainable adsorbent - A critical review	2014	Bioresource Technology	728
Impact of shale gas development on regional water quality	2013	Science	702
Urban wastewater treatment plants as hotspots for the release of antibiotics in the environment: A review	2013	Water Research	666
A review on emerging contaminants in wastewaters and the environment: Current knowledge, understudied areas and recommendations for future monitoring	2014	Water Research	654
Ultrathin graphene nanofiltration membrane for water purification	2013	Advanced Functional Materials	627

Biomimetic super-lyophobic and super-lyophilic materials applied for oil/water separation: A new strategy beyond nature	2015	Chemical Society Reviews	602
A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States	2014	Environmental Science and Technology	600
Photocatalytic organic pollutants degradation in metal-organic frameworks	2014	Energy and Environmental Science	592
Advanced oxidation processes in water/wastewater treatment: Principles and applications. A review	2014	Critical Reviews in Environmental Science and Technology	575
The contentious nature of soil organic matter	2015	Nature	573
The use of zero-valent iron for groundwater remediation and wastewater treatment: A review	2014	Journal of Hazardous Materials	571
Recent developments of zinc oxide based photocatalyst in water treatment technology: A review	2016	Water Research	548
Full-scale partial nitrification/anammox experiences - An application survey	2014	Water Research	545
Multimodel assessment of water scarcity under climate change	2014	Proceedings of the National Academy of Sciences of the United States of America	511
CuO nanostructures: Synthesis, characterization, growth mechanisms, fundamental properties, and applications	2014	Progress in Materials Science	503

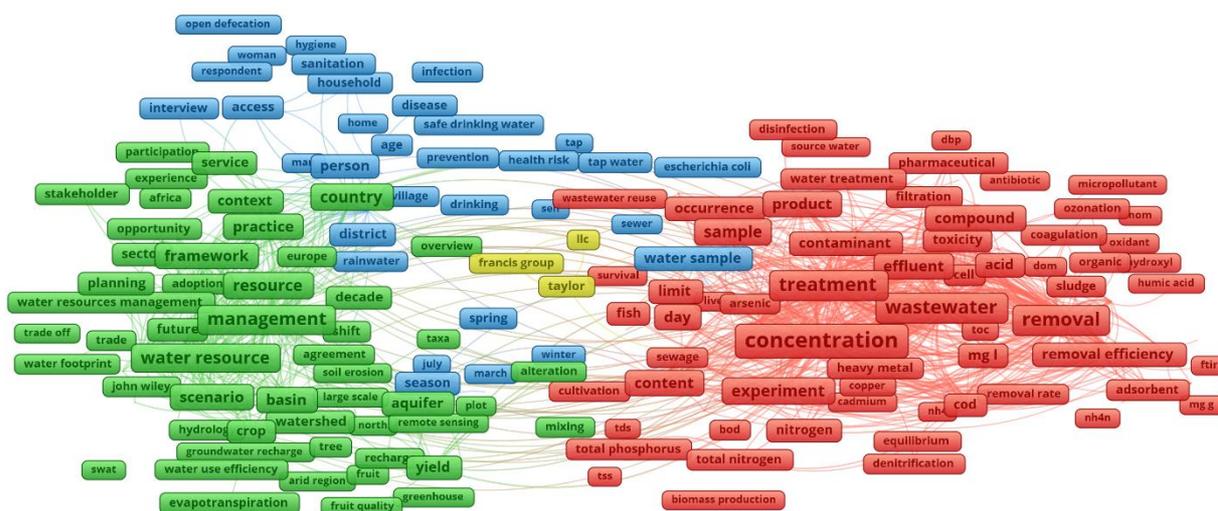
The V5 search was combined with the V4 search to identify which articles were found in V5 but not V4.

The top 20 most-cited articles are relevant to the SDG. One article is not relevant- suggesting the updated search is finding relevant articles.

Title	Year	Source title	Cited by
Toxicity of five antibiotics and their mixtures towards photosynthetic aquatic organisms: Implications for environmental risk assessment	2013	Water Research	270
A synergistic combination of algal wastewater treatment and hydrothermal biofuel production maximized by nutrient and carbon recycling	2013	Energy and Environmental Science	127
The effect of CO ₂ on algal growth in industrial waste water for bioenergy and bioremediation applications	2013	PLoS ONE	41
Characterization of <i>Listeria monocytogenes</i> isolated from Ganges water, human clinical and milk samples at Varanasi, India	2013	Infection, Genetics and Evolution	39
Viral persistence in surface and drinking water: Suitability of PCR pre-treatment with intercalating dyes	2016	Water Research	33
The future of species invasions in the Great Lakes-St. Lawrence River basin	2015	Journal of Great Lakes Research	32
Decay of genetic markers for fecal bacterial indicators and pathogens in sand from Lake Superior	2014	Water Research	28
Diversity and antimicrobial resistance of <i>Salmonella enterica</i> isolates from surface water in southeastern United States	2014	Applied and Environmental Microbiology	26
Can <i>E. Coli</i> or thermotolerant coliform concentrations predict pathogen presence or prevalence in irrigation waters?	2016	Critical Reviews in Microbiology	24

Microbial impact of different types of municipal wastewaters used to irrigate nectarines in southern italy	2013	Agriculture, Ecosystems and Environment	23
Ecological condition and value of oyster reefs of the Southwest Florida shelf ecosystem	2014	Ecological Indicators	21
Beach science in the Great Lakes	2014	Journal of Great Lakes Research	19
Direct large volume injection ultra-high performance liquid chromatography-tandem mass spectrometry determination of artificial sweeteners sucralose and acesulfame in well water	2014	Journal of Chromatography A	17
Radiocesium contamination of lake sediments and fish following the Fukushima nuclear accident and their partition coefficient	2014	Inland Waters	17
Oncogenic Papillomavirus and Polyomavirus in Water Environments: Is There a Potential for Waterborne Transmission?	2014	Food and Environmental Virology	16
Waterborne parasites and physico-chemical assessment of selected lakes in Malaysia	2013	Parasitology Research	16
Seeking the environmental source of Leptospirosis reveals durable bacterial viability in river soils	2017	PLoS Neglected Tropical Diseases	15
DGT-labile As, Cd, Cu and Ni monitoring in freshwater: Toward a framework for interpretation of in situ deployment	2014	Environmental Pollution	15
Preparation and characterization of nickel-spiked freshwater sediments for toxicity tests: Toward more environmentally realistic nickel partitioning	2013	Environmental Toxicology and Chemistry	15
Human exposure to endotoxins and fecal indicators originating from water features	2014	Water Research	13

Co-occurrence map for V5



A random sample of articles from V5 search (using the SDG query tool) were assessed.

Three random samples were generated using the SDG tool. Of the 60 randomly selected articles, one was found to be irrelevant to the SDG. That article does refer to water resources, but in the context of animal disease:

2-s2.0-84898609090 Abiotic factors affecting the persistence of avian influenza virus in surface waters of waterfowl habitats

An example of the article selection is shown below.

Scopus EID	Year	Cited by	Title
2-s2.0-85017027520	2017	17	Removal of pharmaceuticals in conventionally treated wastewater by a polishing moving bed biofilm reactor (MBBR) with intermittent feeding
2-s2.0-85014885062	2017	1	Irrigation method does not affect wild bee pollinators of hybrid sunflower
2-s2.0-84991830066	2016	19	Automatic High Frequency Monitoring for Improved Lake and Reservoir Management
2-s2.0-84992059457	2016	2	Calcium-alginate/carbon nanotubes/TiO ₂ composite beads for removal of bisphenol A
2-s2.0-85017356980	2016	0	Low Impact Development in the USA
2-s2.0-84980343946	2016	0	Evaluation of energy crop cultivation for biogas plants, given the requirements of the European Water Framework Directive (WFD)
2-s2.0-84957876420	2016	14	Experimental investigation of a novel solar thermal polygeneration plant in United Arab Emirates
2-s2.0-84958607189	2016	10	Improving spatiotemporal groundwater estimates after natural disasters using remotely sensed data – a case study of the Indian Ocean Tsunami
2-s2.0-84955239459	2016	3	Optimization of maintenance planning for water distribution networks under random failures
2-s2.0-84964066311	2016	35	Missing the Millennium Development Goal targets for water and sanitation in urban areas
2-s2.0-84938775536	2015	7	Chlorophyll catalyse the photo-transformation of carcinogenic benzo[a]pyrene in water
2-s2.0-84929954558	2015	6	A technique for quantifying groundwater pumping and land subsidence using a nonlinear stochastic poroelastic model
2-s2.0-84920901837	2015	59	Fe ₃ O ₄ and MnO ₂ assembled on honeycomb briquette cinders (HBC) for arsenic removal from aqueous solutions
2-s2.0-84923784782	2015	8	The 'thirsty' water-electricity nexus: Field data on the scale and seasonality of thermoelectric power generation's water intensity in China
2-s2.0-84988432194	2015	0	Filtration parameters of freshwater aquifers estimated from well logs using the Csókás method
2-s2.0-84957935943	2015	1	A problem of groundwater resources
2-s2.0-84937434646	2015	0	Development of metrology to estimate energy requirement for water supply systems
2-s2.0-84911930045	2014	0	Extent of heavy/trace metals/elements contamination of groundwater resources in Ludhiana and Patiala, Punjab
2-s2.0-84901604346	2014	25	Contaminants from Cretaceous black shale: I. Natural weathering processes controlling contaminant cycling in Mancos Shale, southwestern United States, with emphasis on salinity and selenium
2-s2.0-84883143813	2013	25	Constructed wetlands for combined sewer overflow treatment-comparison of German, French and Italian approaches