

# SUSTAINABLE DEVELOPMENT GOALS

At the



UNIVERSITY OF  
TORONTO

A conceptual report of key facts and figures about the University of Toronto's  
impact upon and progress towards the UN Sustainable Development Goals

FEBRUARY 10, 2020

# SUSTAINABLE DEVELOPMENT GOALS



## About this report:

This document is a conceptual report of the University of Toronto's impact upon and progress towards the United Nations Sustainable Development Goals. The data and narrative in this report are factually based but may not be comprehensive or up to date. It is anticipated that this report will evolve over time based on feedback from stakeholders.

Feedback, suggestions, correction requests and questions should be sent to:

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## Introduction:

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. For more information please see:

<https://sustainabledevelopment.un.org/sdgs>

At the University of Toronto, the broader aspects of sustainability are a priority and [The President's Advisory Committee on the Environment, Climate Change, and Sustainability \(CECCS\)](#) was created in 2017 to advance coordination of the University's contributions and objectives on climate change and sustainability pertaining to research and innovation, academic programs, and sustainability initiatives related to our operations.

Additionally, there are many sustainability related activities and operations happening across all three campuses related to research, innovation, teaching, operations, outreach, and partnership that are not clearly identified as being related to SDGs.

Through the CECCS the University of Toronto started to categorize the University's teaching activity by mapping courses offered at the University to the relevant SDG by keyword matching to create a sustainability course inventory. Additional categorization of student based engagement, such as community engaged learning is underway. Please see the CECCS [2019 Annual Report](#) for more details.

This report pulls the data from the [Sustainability course inventory](#) and combines it with similar categorization of the University's research activity as measured by publications and tri-agency grants. These datasets are combined with other relevant information and data related to the SDG on startup companies, university operations, partnerships and outreach and recent items from the University's news archive to create a profile for each SDG. In addition there is an aggregated overview of the data sources to give a sense of the University's overall involvement with the SDGs.

## Report design:

For each of the Sustainable Development Goals there are five categories of information:

- **Research and innovation:** data about the University's scholarly papers, tri-agency grants, start-up companies and other aspects of innovation and entrepreneurship.
- **Teaching:** summary data about the Committee on the Environment, Climate Change and Sustainability's Course Inventory of sustainability related undergraduate courses at the University
- **Operations:** data about the operations of the university with regards to each SDG.
- **Outreach & Partnerships:** Examples of community (local, national and global) outreach, engagement projects, or partnerships related to the SDG.
- **News:** items from the U of T news archive of interest to the SDG

For details of the methodology and sources, please see the appendix.

### **Additional Information:**

Sustainability is a priority for the University of Toronto and there are many other sources of information about the University's activities related to sustainability, including:

- Facilities & Services – [Sustainability Office](#) (St George):
  - [Sustainability Reports](#) & [Low-Carbon Action Plan](#)
- [Sustainability Office](#) at the University of Toronto Scarborough
- [Sustainability Office](#) at the University of Toronto Mississauga
- [Sustainability website](#), Office of the President
  - [Beyond Divestment: Taking Decisive Action on Climate Change](#)
  - [The President's Advisory Committee on the Environment, Climate Change, and Sustainability \(CECCS\):](#)
    - [2019 Annual Report](#)
    - [Sustainability course inventory](#)

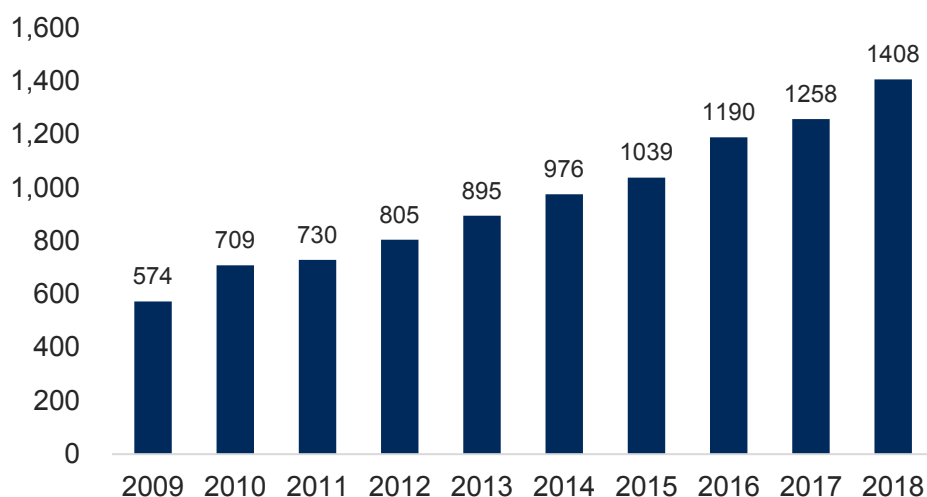
## Sustainable Development Goals at the University of Toronto:

### RESEARCH & INNOVATION:

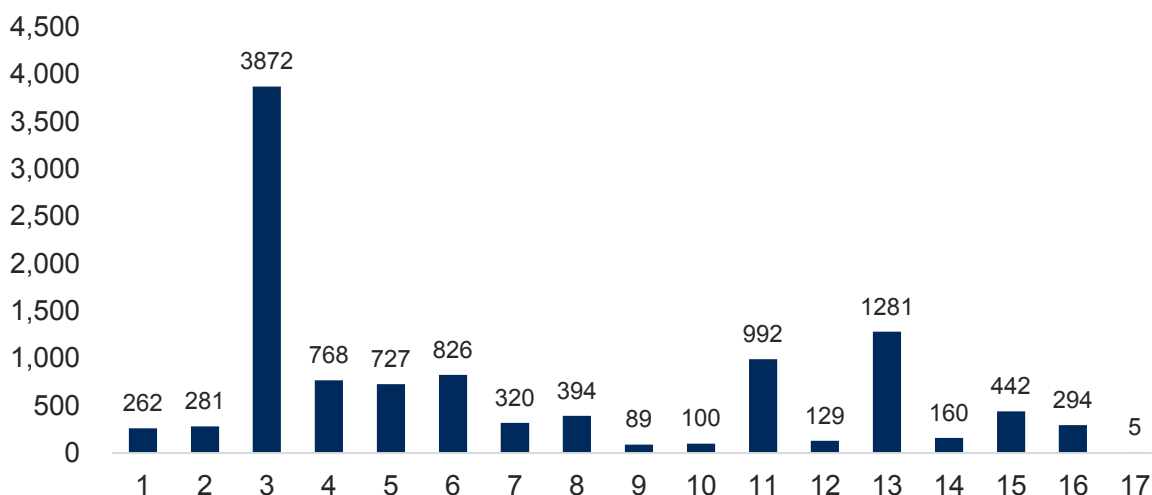
In total there were 9,485 scholarly publications published by University of Toronto scholars between 2009 and 2018 that included keywords relating to the Sustainable Development Goals. This represents 7.2% of all U of T publications in the same period, this proportion grew from 5.4% in 2009 to 9.0% in 2018.

U of T ranks second in the world (behind Harvard with 15,015 publications) for the number of publications related to the SDGs (2009-2018), up from fourth when only looking at publications in 2009.

*Sustainable Development Goal related papers published by scholars at the University of Toronto - 2009-2018*



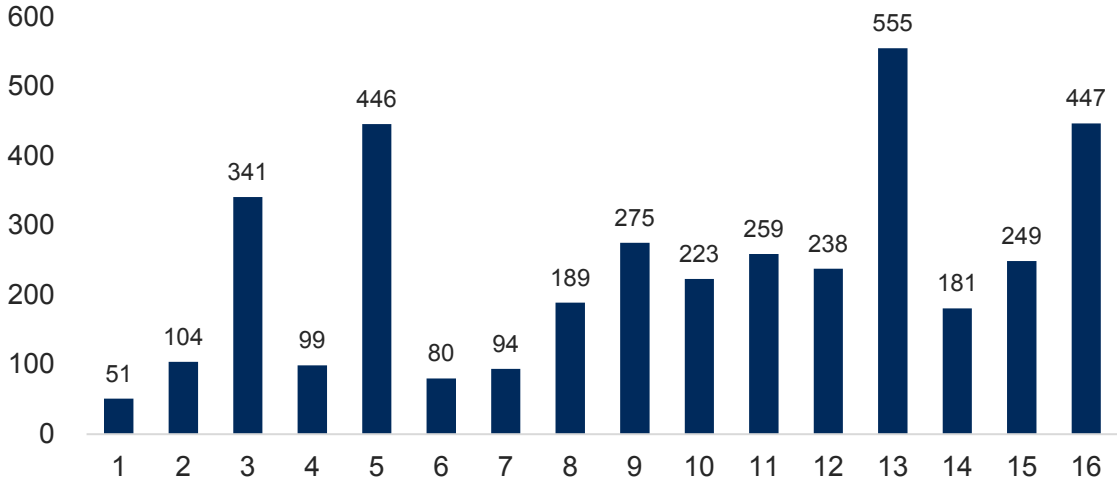
*Sustainable Development Goal related papers published by scholars at the University of Toronto, by SDG*



**TEACHING:**

In total there are 2,228 unique courses taught at the University of Toronto (academic year 2019-20) that are related to Sustainable Development Goals.

*Sustainable Development Goal related courses taught at the University of Toronto (2019-20), by SDG*



SDG 17 was not included in the analysis.

# 1 NO POVERTY



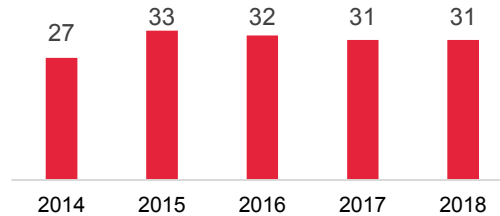
## SUSTAINABLE DEVELOPMENT GOAL 1 – NO POVERTY

End poverty in all its forms everywhere

### RESEARCH & INNOVATION:

- The University of Toronto was ranked 15<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG1. There were 262 papers published between 2009 and 2018.
- U of T faculty and students secured 210 tri-council research grants between 2010 and 2017.

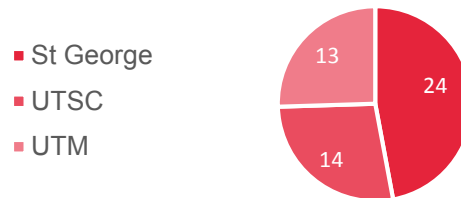
Publications relating to SDG1 by U of T researchers



### TEACHING:

- There are 51 undergraduate courses at the University of Toronto related to SDG1.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG1 at U of T's three campuses



### OPERATIONS:

- There are 39 faculty at the University of Toronto whose work is closely related to SDG1.
- The University of Toronto's policy on Student Financial Support states "No student offered admission to a program at the University of Toronto should be unable to enter or complete the program due to lack of financial means." See the policy in full at: <https://governingcouncil.utoronto.ca/secretariat/policies/student-financial-support-policy-april-30-1998>

### OUTREACH & PARTNERSHIP:

The [Reach Project](#) at the University of Toronto is "inspired by the 2030 Sustainable Development Goals (SDGs) agenda and, specifically, the assertion that truly inclusive growth can only come when no one is left behind" and "The Reach Project is uncovering new and novel insights into global development through its world-class research, and cultivating the next generation of global leadership talent — young leaders equipped with the skills and empowered with the experiences to change the world."



# 1 NO POVERTY



## SUSTAINABLE DEVELOPMENT GOAL 1

End poverty in all its forms everywhere

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### OUTREACH & PARTNERSHIP (cont.):

Each year, the [University of Toronto PBSC Chapter](#) over 120 law student volunteers work in collaboration with community clinics and not-for-profit organizations, courts, tribunals, and academic institutions to deliver high-quality legal services to Canada's most vulnerable communities.

### U OF T NEWS RELATED TO SDG 1:



January 9, 2019

[Stranded without transit? U of T researchers say one million urban Canadians suffer from 'transport poverty'](#)



March 15, 2017

[Poverty is a significant risk factor for premature death, U of T researcher finds](#)



November 22, 2016

[U of T Libraries to forgive some overdue fines for canned goods donations](#)

## 2 ZERO HUNGER



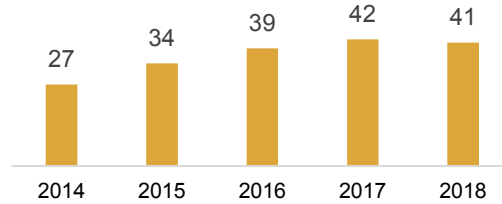
## SUSTAINABLE DEVELOPMENT GOAL 2 – ZERO HUNGER


End hunger, achieve food security and improved nutrition and promote sustainable agriculture


### RESEARCH & INNOVATION:

- The University of Toronto was ranked 26<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG2. There were 281 papers published between 2009 and 2018.
- U of T faculty and students secured 210 tri-council research grants between 2010 and 2017.

Publications relating to SDG2 by U of T researchers



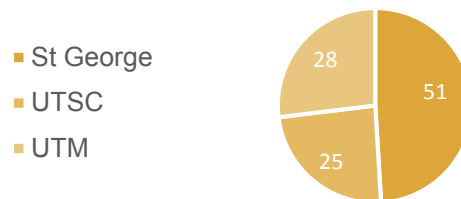
 **JUST VERTICAL** a U of T start-up: promoting food sustainability through simple indoor hydroponic vertical gardens. <https://justvertical.com/>

 **UKKO AGRO** a U of T start-up: Smart agriculture ecosystem that helps optimize pesticide usage to minimize crop loss. <https://ukko.ag/>

### TEACHING:

- There are 104 undergraduate courses at the University of Toronto related to SDG2.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG2 at U of T's three campuses



### OPERATIONS:

- There are 65 faculty at the University of Toronto whose work is closely related to SDG2.
- [Food Services at the University of Toronto](#) strive to ensure that campus food services provide a wide range of affordable sustainable and nutritious food options. Additionally the [Local Food Standards](#) were created to promote an increase in the volume of local ingredients and products sourced by campus food providers, raise awareness of local food options within the university community, support sustainable and responsible farming practices, and ensure that clearly defined labeling standards are maintained across the St. George campus.

### OUTREACH & PARTNERSHIP:

The mission of the [Canadian Centre for World Hunger Research \(CCWHR\)](#) at the University of Toronto Scarborough is to advance global food security through the development and innovative application of cutting-edge science and technology.

## 2 ZERO HUNGER



### SUSTAINABLE DEVELOPMENT GOAL 2

End hunger, achieve food security and improved nutrition and promote sustainable agriculture

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#### OUTREACH & PARTNERSHIP (cont.):

The Centre will strive to deliver major improvements in the productivity and sustainability of the world's leading crops, particularly in the context of the needs of the developing world. In addition, the Centre will play a leading role in educating the Canadian public about hunger and its alleviation.

[PROOF](#) is an interdisciplinary research team investigating household food insecurity in Canada. The goal of this research program is to identify effective policy approaches to reduce household food insecurity, which is defined as the inadequate or insecure access to food due to financial constraints.

#### U OF T NEWS RELATED TO SDG 2:



April 22, 2019

[EaRTH-focused: U of T-Centennial College partnership to advance cleantech, build 'vertical farm'](#)



July 12, 2018

[U of T researcher plugs data gaps on food and global child health](#)



March 9, 2018

[Data-driven farming: U of T alumni's startup develops low-cost sensors for Nepal](#)

### 3 GOOD HEALTH AND WELL-BEING



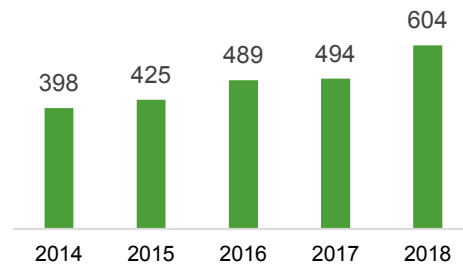
## SUSTAINABLE DEVELOPMENT GOAL 3 – GOOD HEALTH AND WELL BEING

Ensure healthy lives and promote well-being for all at all ages.

### RESEARCH & INNOVATION:

- The University of Toronto was ranked **3<sup>rd</sup>** in the world among universities for the volume of scholarly publications related to SDG3. There were 3,872 papers published between 2009 and 2018.
- U of T faculty and students secured 1,136 tri-council research grants between 2010 and 2017.

Publications relating to SDG3 by U of T researchers



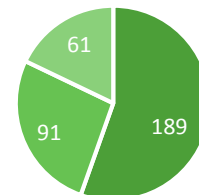
**EMPOWER health** a U of T start-up: Helps patients find the care they need and healthcare providers deliver the best quality of service to patients by developing various healthtech platforms. <https://www.empower.ca/>

### TEACHING:

- There are 341 undergraduate courses at the University of Toronto related to SDG3.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG3 at U of T's three campuses

- St George
- UTSC
- UTM



### OPERATIONS:

- There are 225 faculty at the University of Toronto whose work is closely related to SDG3.
- There are [nine hospitals](#) in the Greater Toronto Area are fully affiliated with the University of Toronto

### OUTREACH AND PARTNERSHIP:

- The [World Health Organization's Collaborating Centre for Governance, Accountability and Transparency in the Pharmaceutical Sector](#) was established in 2015 at the Leslie Dan Faculty of Pharmacy is charged with conducting research, analysis, and training on critical issues related to good governance and transparency in medicines.
- Global child health is the health and well-being of children everywhere, independent of geographic borders. The Hospital for Sick Children (SickKids) [Center for Global Child Health](#) is recognized as one of the world's foremost paediatric health-care institutions and is Canada's leading centre dedicated to advancing children's health through the integration of patient care, research and education.

**3** GOOD HEALTH  
AND WELL-BEING



**SUSTAINABLE DEVELOPMENT GOAL 3**

Ensure healthy lives and promote well-being for all at all ages.

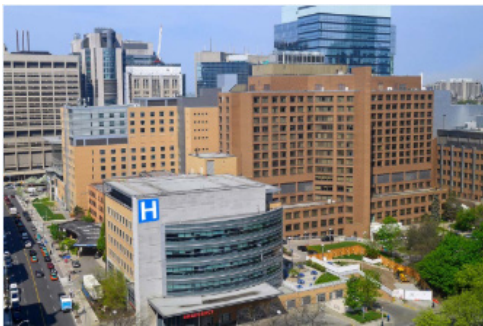
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**U OF T NEWS RELATED TO SDG 3:**



November 13, 2019

[U of T researcher helps develop simple, low-cost way for countries to measure public health](#)



November 13, 2019

[U of T's Centre for Sustainable Health Systems to focus on reducing health-care sector's environmental impact](#)



April 7, 2019

[Fewer children walk or bike to school, U of T research finds – and that hurts everyone](#)



September 10, 2018

[Scholars from U of T's WHO Collaborating Centre develop blueprint to combat global corruption in health sector](#)

## 4 QUALITY EDUCATION



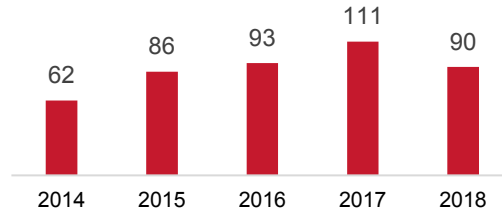
### SUSTAINABLE DEVELOPMENT GOAL 4 – QUALITY EDUCATION

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

#### RESEARCH & INNOVATION:

- The University of Toronto was ranked 4<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG4. In total there were 768 publications between 2009 and 2018.
- U of T faculty secured 423 tri-council research grants between 2010 and 2017.

Publications relating to SDG4 by U of T researchers

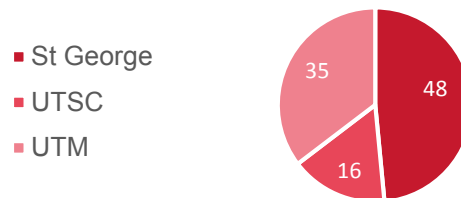


**Pueblo Science** a U of T start-up: A registered charity founded by scientists and engineers whose mission is to advance science education across the world and create lasting solutions to poverty. <https://puebloscience.org/>

#### TEACHING:

- There are 99 undergraduate courses at the University of Toronto related to SDG4.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

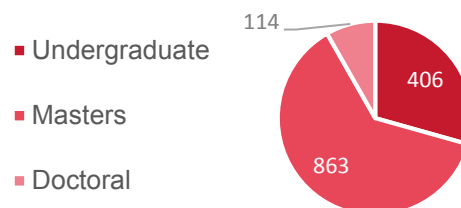
Courses related to SDG4 at U of T's three campuses



#### OPERATIONS:

- There are 48 faculty at the University of Toronto whose work is closely related to SDG4.
- The [School of Continuing Studies](#) offers over 700 courses in 40 program areas.
- The [Ontario Institute for Studies in Education \(OISE\)](#) is a recognized global leader in teaching, learning, continuing teacher education and education research.

Degrees awarded (2018) in Education and Physical Education





## SUSTAINABLE DEVELOPMENT GOAL 4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

### OUTREACH & PARTNERSHIP:

The [Centre for Community Partnerships](#) connects students with opportunities to take and action and learn from intentional community based partnerships outside of the classroom, while building sustainable partnerships with community organizations across the GTA and Peel regions.

Professor [Karen Mundy](#) at the [Ontario Institute for Studies in Education \(OISE\)](#) is a leading expert on education in the developing world. She has made significant contributions via UNESCO to the achievement of SDG4.

### U OF T NEWS RELATED TO SDG 4:



September 25, 2019

[Prize-winning undergraduate research takes stock of U of T's sustainability-related courses, groups and projects](#)



April 11, 2019

[U of T's Munk One program teaches students how to tackle global issues](#)



October 4, 2017

[U of T startup's Talking Stickers among Top 100 innovations in education](#)



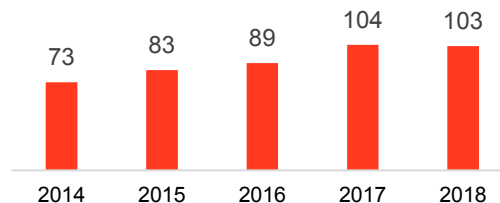
## SUSTAINABLE DEVELOPMENT GOAL 5 – GENDER EQUALITY

Achieve gender equality and empower all women and girls

### RESEARCH & INNOVATION:

- The University of Toronto was ranked 4<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG5. With 727 publications between 2009 and 2018
- U of T faculty secured 210 tri-council research grants between 2010 and 2017.

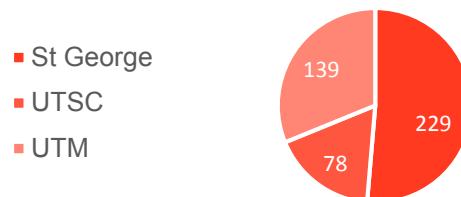
Publications relating to SDG5 by U of T researchers



### TEACHING:

- There are 446 undergraduate courses at the University of Toronto related to SDG5.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG5 at U of T's three campuses



### OPERATIONS:

- There are 53 faculty at the University of Toronto whose work is closely related to SDG5.
- The University of Toronto's [Statement on Equity, Diversity, and Excellence](#) outlines a series of policies regarding equity and diversity at the University.
- In 2016 the University of Toronto released its [Final Report of Presidential and Provostial Advisory Committee on Prevention and Response to Sexual Violence](#) and subsequent [Response to the Final Report of the Presidential and Provostial Advisory Committee on Preventing and Responding to Sexual Violence](#). More information on the reports and the response can be found at: <https://www.provost.utoronto.ca/committees/prevention-response-to-sexual-violence/> additionally as one of the recommendations was the creation of the [Sexual Violence Prevention & Support Centre](#).
- The [Sexual & Gender Diversity Office \(SGDO\)](#) at the University of Toronto develops partnerships to build supportive learning and working communities at the University of Toronto by working towards equity and challenging discrimination. The Office provides innovative education, programming, resources and advocacy on sexual and gender diversity for students, staff and faculty across the University's three campuses.
- University of Toronto Scarborough also supports an [Equity, Diversity and Inclusion Office](#)
- University of Toronto Mississauga also supports an [Equity and Diversity office](#)





## SUSTAINABLE DEVELOPMENT GOAL 5

Achieve gender equality and empower all women and girls

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### OUTREACH & PARTNERSHIP:

The [Women & Gender Studies Institute \(WGSI\)](#) at the University of Toronto is dedicated to exploring the entangled work of gender, race and sexuality in identities, relations, practices, theories and institutions. WGSI connects its activities beyond the classroom with our exciting practicum program that offers students the chance to work with community organizations and our many community-engaged research projects. In these ways, WGSI aspires to provide students with experiences that will not only transform their thinking, but also support their future undertakings and sense of self.

The [Institute for Gender and the Economy \(GATE\)](#) at the Rotman School of Management promotes an understanding of gender inequalities and how they can be remedied – by people of all genders – in the world of business and, more broadly, in the economy.

### U OF T NEWS RELATED TO SDG 5:



December 9, 2019

[U of T sociologist studies women's careers in 'exciting and terrifying' tech sector](#)



November 15, 2019

[New interventions could help children accept gender-diverse peers. U of T study finds](#)



October 30, 2019

[Female doctors better for health care, but experience gender pay gap, discrimination and depression: U of T expert](#)

## 6 CLEAN WATER AND SANITATION



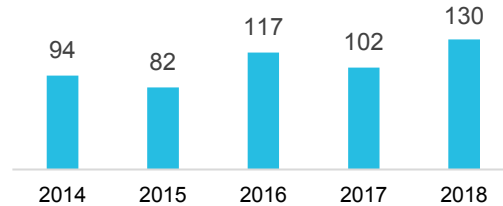
### SUSTAINABLE DEVELOPMENT GOAL 6 - CLEAN WATER AND SANITATION

Ensure availability and sustainable management of water and sanitation for all

#### RESEARCH:

- The University of Toronto was ranked 58<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG6. In total there were 826 publications between 2009 and 2018.
- U of T faculty secured 142 tri-council research grants between 2010 and 2017.

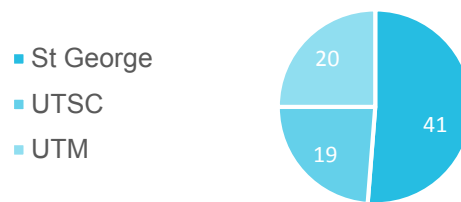
Publications relating to SDG6 by U of T researchers



#### TEACHING:

- There are 80 undergraduate courses at the University of Toronto related to SDG6.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Course related to SDG6 at U of T's three campuses



#### OPERATIONS:

- There are 27 faculty at the University of Toronto whose work is closely related to SDG6.
- In 2018 the University used 1,526,766,000 litres of which 4,495,000 litres were collected from rain water.
- Signatory to the "[Ontario universities committed to a greener world](#)"
- The University is committed to sustainable buildings both new and old. New buildings are built to LEED silver standard at minimum and older buildings are being retrofitted. [Deerfield Hall](#) at UTM is an example of how sustainable water usage is embedded into the design

#### OUTREACH & PARTNERSHIP:

- The [Drinking Water Research Group](#) work with partners from industry and government on a wide range of projects related to municipal drinking water.
- The University of Toronto [Campus as a Living Lab](#) initiative incorporate experiential learning opportunities through collaborations with operational and community partners to identify and solve real sustainability issues. Examples relating to SDG 6 include:
  - Water Conservation Project at Trinity College: A Rainwater Harvesting Proposal for the Rooftop Garden at North Munk
  - Sustainable Building Design Standards

**6** CLEAN WATER AND SANITATION



**SUSTAINABLE DEVELOPMENT GOAL 6**

**Ensure availability and sustainable management of water and sanitation for all**

**U OF T NEWS RELATED TO SDG 6:**



July 19, 2019

[Is there plastic in our drinking water? Probably – and U of T researchers are studying how concerned we should be](#)



July 11, 2019

[U of T study of oil sands monitoring suggests poor understanding of emissions – and their impact](#)



July 9, 2019

[U of T researcher proposes new model to analyze world's 'intermittent' water systems](#)

## 7 AFFORDABLE AND CLEAN ENERGY



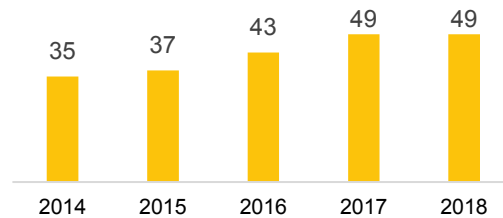
### SUSTAINABLE DEVELOPMENT GOAL 7 – AFFORDABLE AND CLEAN ENERGY

Ensure access to affordable, reliable, sustainable and modern energy for all

#### RESEARCH & INNOVATION:

- The University of Toronto was ranked 99<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG7. With 320 publications between 2009 and 2018
- U of T faculty secured 383 tri-council research grants between 2010 and 2017.

Publications relating to SDG7 by U of T researchers



**Reeddi** founded by University of Toronto alumni and supported by the University's Entrepreneurship Hatchery, is a clean energy start-up. Reeddi sustainably provides clean energy at a price point that individuals and businesses operating in energy poor regions of the world can afford. Find out more at: <https://www.reeddi.com/>

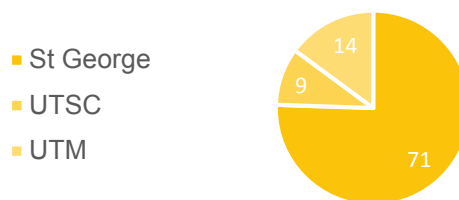


**QDSolar** a spinoff company from the University of Toronto utilizes Quantum Dot technology in combination with traditional solar cell technology to improve efficiency via conversion of a broad solar spectrum into electrical energy.

#### TEACHING:

- There are 94 undergraduate courses at the University of Toronto related to SDG7.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG7 at U of T's three campuses



#### OPERATIONS:

- There are 61 faculty at the University of Toronto whose work is closely related to SDG7.
- The University of Toronto's [Low-Carbon Action Plan 2019-2024](#) outlines many clean energy initiatives such as Solar Energy. Additionally, it outlines how electricity, steam, and waste energy generated by the Central Plant are utilized and distributed in an efficient and affordable manner.

## 7 AFFORDABLE AND CLEAN ENERGY



## SUSTAINABLE DEVELOPMENT GOAL 7

Ensure access to affordable, reliable, sustainable and modern energy for all

### OUTREACH & PARTNERSHIP:

The [Institute for Sustainable Energy \(ISE\)](#) at the University of Toronto is an inclusive, multidisciplinary centre designed to bring together researchers, students, and teachers from across the university, together with partners from industry and government, with the goal of increasing energy efficiency and reducing the environmental impact of energy use and conversion.

The [Clean Energy Lab](#) at the University of Toronto Scarborough works on developing new materials for Li-ion batteries, hydrogen storage, CO2 capture, and photovoltaics. Utilizing atomistic simulations, machine learning, automated high-throughput materials synthesis and characterization to demonstrate proof-of-principle devices that will speed-up the transition to renewables.

### U OF T NEWS RELATED TO SDG 7:



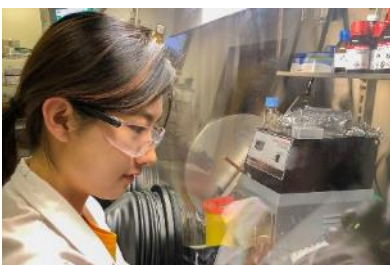
October 29, 2019

[U of T entrepreneur creates his own job post-graduation: Delivering clean, affordable energy to Nigeria](#)



October 15, 2019

[U of T's proposed geotreatment project on Front Campus is one of urban Canada's largest](#)



August 12, 2019

[U of T study finds success in combining two emerging technologies for next-generation solar power](#)

## 8 DECENT WORK AND ECONOMIC GROWTH



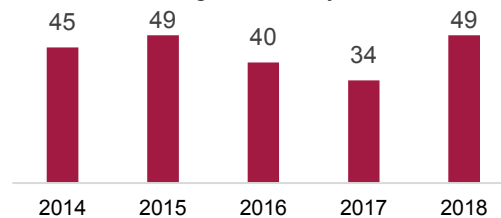
### SUSTAINABLE DEVELOPMENT GOAL 8 – DECENT WORK AND ECONOMIC GROWTH

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

#### RESEARCH & INNOVATION:

- The University of Toronto was ranked 14<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG8. With 394 publications between 2009 and 2018
- U of T faculty secured 343 tri-council research grants between 2010 and 2017.

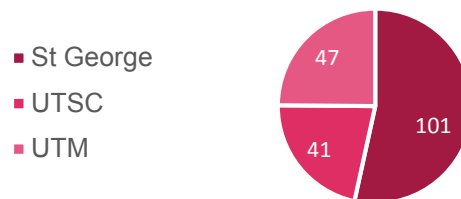
Publications relating to SDG8 by U of T researchers



#### TEACHING:

- There are 189 undergraduate courses at the University of Toronto related to SDG8.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG8 at U of T's three campuses



#### OPERATIONS:

- There are 79 faculty at the University of Toronto whose work is closely related to SDG8.
- The University of Toronto has [28 employee groups](#) (unions and others).
- The University of Toronto has multiple awards as an employer including:
  - Canada's Top 100 Employers 2020
  - Canada's Top Family Friendly employers 2019
  - 2019 Top Employers for Canadians over 40
  - 2019 Canada's Greenest Employers
  - Greater Toronto's Top 2019 Employers
  - 2019 Canada's Best Diversity Employers
- The University publishes a [Human Resources & Equity Annual Report](#)



## SUSTAINABLE DEVELOPMENT GOAL 8

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

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### OUTREACH & PARTNERSHIP:

[University of Toronto Entrepreneurship](#) community is Canada's leading engine for research-based startups and a global leader in transforming ideas into products and services that impact the world. In the past ten years, more than 500 research-based startups have been launched from U of T, outpacing every other Canadian university and generating more than \$1 billion (CAD) in investment.

### U OF T NEWS RELATED TO SDG 8:



November 21, 2019

[Workers in the gig economy feel lonely and powerless, say experts from U of T and other universities](#)



November 12, 2019

[U of T researchers, innovators to pitch ideas for Ontario's growth at annual economic summit](#)



June 20, 2019

[Canada's restrictions on foreign competition hurt the economy, U of T researchers argue in Globe and Mail](#)

## 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



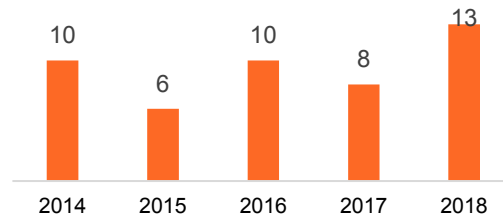
### SUSTAINABLE DEVELOPMENT GOAL 9 – INDUSTRY, INNOVATION AND INFRASTRUCTURE

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

#### RESEARCH & INNOVATION:

- The University of Toronto was ranked 50<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG9. With 89 publications between 2009 and 2018
- U of T faculty secured 204 tri-council research grants between 2010 and 2017.

Publications relating to SDG9 by U of T researchers

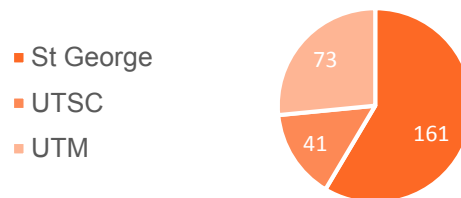


*Cast Connex*, a University of Toronto start-up company, is a North American industry leader in standardized and customized cast steel structural components for buildings and bridges, focussed on creating safer, innovative, and more beautiful built environments. Cast Connex is also part of an industry-wide coalition to prepare Haiti for another major earthquake like the one that devastated the country in 2010.

#### TEACHING:

- There are 275 undergraduate courses at the University of Toronto related to SDG9.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG9 at U of T's three campuses



#### OPERATIONS:

- There are 34 faculty at the University of Toronto whose work is closely related to SDG9.
- The University of Toronto's [Department of Civil & Mineral Engineering](#) is a preeminent leader in education and research in systems-based approaches to developing sustainable solutions for the global community across the spectrum from mineral engineering to urban infrastructure. The department conducts research across a wide range of relevant fields and the department teaches a variety of undergraduate and graduate degrees training future leaders in the development of infrastructure around the globe.





Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

### OUTREACH & PARTNERSHIP:

The [Innovation Policy Lab](#) at the *Munk School of Global Affairs and Public Policy* mission is to study, teach, and apply novel methods and disciplines to the study of innovation and its impact on growth and society. Areas of focus include: innovation and growth, innovation and inequality, globalization and innovation, social innovation, new technologies and their impact on society, innovation in traditional industries, and arts and innovation.

The [Toronto Institute of Advanced Manufacturing \(TIAM\)](#) mission is to expedite research and development of advanced manufacturing technologies by creating a multidisciplinary network focused on sharing knowledge, ideas and resources. TIAM strives for global leadership by translating lab-based technologies into commercial, scaled-up processes and by contributing to the education and training of highly qualified personnel in the manufacturing sector.

### U OF T NEWS RELATED TO SDG 9:



November 25, 2019

[Reconciliation through Engineering Initiative to help improve Indigenous housing, transportation](#)



September 18, 2019

[From wood towers to more efficient mining: How U of T is driving innovation, economic prosperity across Ontario](#)



May 24, 2019

[‘Future-proofing Ontario’s economy’: U of T researchers to showcase advanced manufacturing innovations](#)



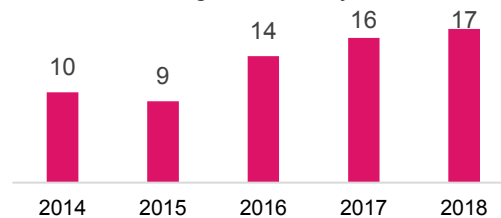
## SUSTAINABLE DEVELOPMENT GOAL 10 – REDUCED INEQUALITIES

Reduce inequality within and among countries

### RESEARCH & INNOVATION:

- The University of Toronto was ranked 12<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG10. With 100 publications between 2009 and 2018
- U of T faculty secured 122 tri-council research grants between 2010 and 2017.

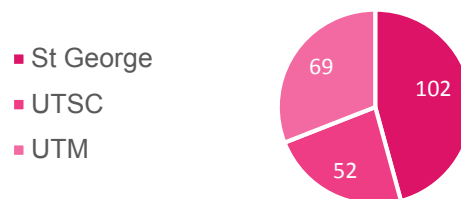
Publications relating to SDG10 by U of T researchers



### TEACHING:

- There are 223 undergraduate courses at the University of Toronto related to SDG10.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG10 at U of T's three campuses



### OPERATIONS:

- There are 23 faculty at the University of Toronto whose work is closely related to SDG9.
- The University of Toronto places a high priority on making the University accessible to all regardless of their economic circumstances. See the [Annual Report on Student Financial Support](#) for more details.
- The University of Toronto's policy on Student Financial Support states "No student offered admission to a program at the University of Toronto should be unable to enter or complete the program due to lack of financial means." See the policy in full at: <https://governingcouncil.utoronto.ca/secretariat/policies/student-financial-support-policy-april-30-1998>

## 10 REDUCED INEQUALITIES



### SUSTAINABLE DEVELOPMENT GOAL 10

Reduce inequality within and among countries

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#### OUTREACH & PARTNERSHIP:

The [Reach Project](#) at the University of Toronto is “*inspired by the 2030 Sustainable Development Goals (SDGs) agenda and, specifically, the assertion that truly inclusive growth can only come when no one is left behind*” and “*The Reach Project is uncovering new and novel insights into global development through its world-class research, and cultivating the next generation of global leadership talent — young leaders equipped with the skills and empowered with the experiences to change the world.*”

#### U OF T NEWS RELATED TO SDG 10:



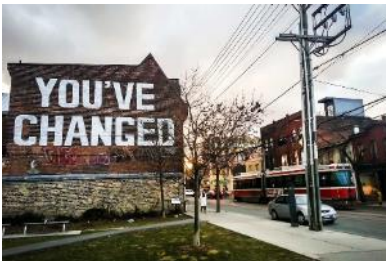
July 11, 2019

[Real or fake? U of T law students work with Amnesty International to verify conflict zone videos](#)



November 16, 2018

['There's inequality in death': U of T statistician analyzes mortality data to help level the playing field](#)



November 01, 2017

[Gap is growing between rich and poor in Toronto, warns report by U of T researchers, United Way](#)

## 11 SUSTAINABLE CITIES AND COMMUNITIES



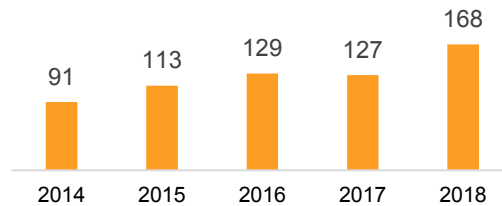
### SUSTAINABLE DEVELOPMENT GOAL 11 – SUSTAINABLE CITIES AND COMMUNITIES

Make cities and human settlements inclusive, safe, resilient and sustainable

#### RESEARCH:

- The University of Toronto was ranked 4<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG11. In total there were 992 publications between 2009 and 2018.
- U of T faculty secured 331 tri-council research grants between 2010 and 2017.

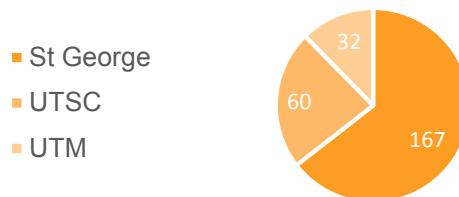
Publications relating to SDG11 by U of T researchers



#### TEACHING:

- There are 259 undergraduate courses at the University of Toronto related to SDG11.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Course related to SDG11 taught at U of T's three campuses



#### OPERATIONS:

- There are 48 faculty at the University of Toronto whose work is closely related to SDG11.
- The University's three campuses are also important public [Green Spaces](#) for our local communities.

Additionally the University provides a wealth of arts and cultural assets such as: [Art Galleries and Museums](#), [Theatres](#), [Athletics facilities](#), and [Libraries](#).

#### OUTREACH & PARTNERSHIP:

- The University of Toronto's [School of Cities](#) is a world-leading centre for innovative interdisciplinary urban research, education and engagement. [Outreach and partnership](#) are core to the school's mission and there are a variety of ongoing activities such as [Public Events](#) and the [Community-Builders Fellowship](#).
- The University is working in partnership with the City of Toronto to develop its [Secondary Plan](#) the three main objectives are: Conserving and protecting cultural heritage resources; Enhancing and expanding the public realm; and Identifying opportunities for new development.



## SUSTAINABLE DEVELOPMENT GOAL 11

Make cities and human settlements inclusive, safe, resilient and sustainable

### U OF T NEWS RELATED TO SDG 11:



November 25, 2019

[Cities need to innovate to improve transportation and reduce emissions: U of T expert](#)



November 14, 2019

[Don't forget about community centres amid Toronto's condo boom, writes U of T's Jeff Biggar in the Globe and Mail](#)



November 8, 2019

[What does transportation equity mean? U of T researcher on why it's too important to ignore](#)



November 1, 2019

[U of T supports Toronto city council request for mental health funding](#)



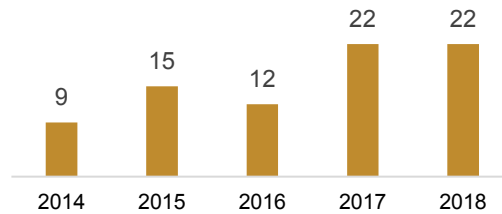
## SUSTAINABLE DEVELOPMENT GOAL 12 – RESPONSIBLE CONSUMPTION AND PRODUCTION

Ensure sustainable consumption and production patterns

### RESEARCH & INNOVATION:

- The University of Toronto was ranked 119<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG12. With 129 publications between 2009 and 2018
- U of T faculty secured 239 tri-council research grants between 2010 and 2017.

Publications relating to SDG12 by U of T researchers



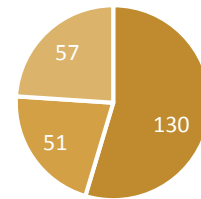
One of the University of Toronto's many startups - **Ardra**: Making Chemicals Sustainable - Ardra's ingredients are created by fermenting natural sugars, and are free of harmful residues that may be found in petroleum-derived synthetic ingredients.

### TEACHING:

- There are 238 undergraduate courses at the University of Toronto related to SDG12.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG12 at U of T's three campuses

- St George
- UTSC
- UTM



### OPERATIONS:

- There are 48 faculty at the University of Toronto whose work is closely related to SDG12.
- Recycling and waste reduction are high priorities at the University of Toronto and the University's sustainability offices at the [St. George](#), [Mississauga](#) and [Scarborough](#) campuses provide a wealth of information about waste reduction and recycling policies and procures.



## SUSTAINABLE DEVELOPMENT GOAL 12

Ensure sustainable consumption and production patterns

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### OUTREACH & PARTNERSHIP:

The *President's Advisory Committee on the Environment, Climate Change, and Sustainability* brings together leading experts that advance the University's understanding of complex issues and items for action that mobilize the University of Toronto a global leader in sustainability research, education, operations, and community partnerships. For more information see the [Annual Report 2019 – From Vision to Action](#).

### U OF T NEWS RELATED TO SDG 12:



November 26, 2019

[U of T entrepreneur to make leather goods out of old airline seats](#)



May 1, 2019

[Startup founded by U of T alumni to clean up the lithium-ion battery supply chain](#)



May 3, 2018

[Paddle the Don offers U of T ecologists the perfect opportunity to lead a trash cleanup](#)

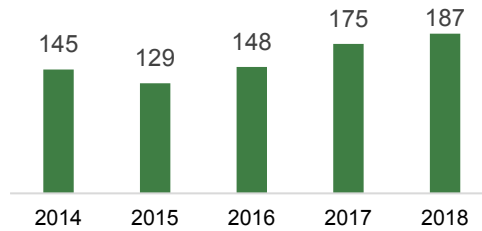


**Take urgent action to combat climate change and its impacts**

**RESEARCH & INNOVATION:**

- The University of Toronto was ranked 41<sup>st</sup> in the world among universities for the volume of scholarly publications related to SDG13. With 1,281 publications between 2009 and 2018
- U of T faculty secured 311 tri-council research grants between 2010 and 2017.

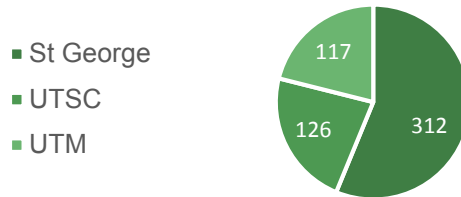
*Publications relating to SDG13 by U of T researchers*



**TEACHING:**

- There are 555 undergraduate courses at the University of Toronto related to SDG13.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

*Courses related to SDG13 at U of T's three campuses*



**OPERATIONS:**

- There are 86 faculty at the University of Toronto whose work is closely related to SDG13.
- The *President's Advisory Committee on the Environment, Climate Change, and Sustainability* brings together leading experts that advance the University's understanding of complex issues and items for action that mobilize the University of Toronto a global leader in sustainability research, education, operations, and community partnerships. For more information see the [Annual Report 2019 – From Vision to Action](#).
- In 2018, the University of Toronto joined the University Climate Change Coalition (UC3); a group of leading research universities in North America committed to reducing greenhouse gas (GHG) emissions on their own campuses and in their communities. In line with this commitment, the University of Toronto set a goal to reduce GHG emissions 37 per cent by 2030, below a 1990 baseline level.  
 University operations has reduced greenhouse gas emissions by more than 55,000 metric tons over the past decade. A five-year Low-Carbon Action Plan (2019-2024) has been developed to further implement carbon reduction strategies across U of T's three campuses—accelerating efforts as we work towards our 2030 goal.  
 See U of T's [Low-Carbon Action Plan \(2019-2024\)](#) for details of our plans to meet our climate change commitments.





**OUTREACH & PARTNERSHIP:**

The [Centre for Global Change Science](#) serves as the University's focal point for research and education in Global Change Science. Additionally, the Centre offers a variety of outreach services including frequent seminars and training programs.

There are many student groups at the University of Toronto related to climate change. Many of which are listed on the [School of the Environment's website](#).

**U OF T NEWS RELATED TO SDG 13:**



December 12, 2019

[Halting climate change means a world without fossil fuels – not merely curbing emissions: U of T researchers](#)



November 13, 2019

[U of T's Centre for Sustainable Health Systems to focus on reducing health-care sector's environmental impact](#)



October 22, 2019

[Time to act on climate change is now, Suzuki tells U of T sustainability conference](#)



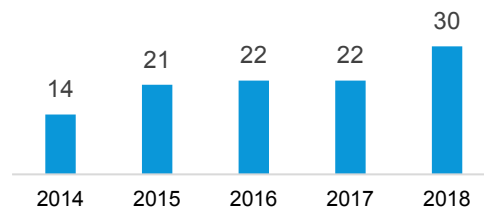
## SUSTAINABLE DEVELOPMENT GOAL 14 – LIFE BELOW WATER

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

### RESEARCH & INNOVATION:

- The University of Toronto had 160 scholarly publications related to SDG14 between 2009 and 2018
- U of T faculty secured 79 tri-council research grants between 2010 and 2017.

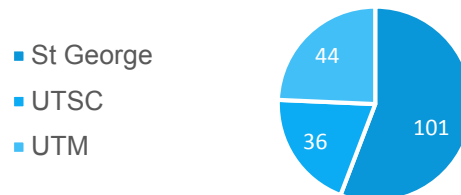
Publications relating to SDG14 by U of T researchers



### TEACHING:

- There are 181 undergraduate courses at the University of Toronto related to SDG14.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG14 at U of T's three campuses



### OPERATIONS:

- There are 30 faculty at the University of Toronto whose work is closely related to SDG14.
- The [Department of Ecology & Evolutionary Biology \(EEB\)](#) at the University of Toronto is one of the largest departments of its kind in North America, with internationally renowned and award-winning faculty.
  - The [Conservation Science Group](#) at the EEB is a collaboration of undergraduate students, graduate students, postdoctoral researchers and faculty interested in conservation science at the University of Toronto.

### OUTREACH & PARTNERSHIP

The [Rochman Lab](#) are committed to doing ecological research that is applicable to management. To bridge the gap between academia and management, we collaborate with non-profit organizations and government agencies.

Research at the Rochman Lab seeks to understand the sources, fate and ecological implications of anthropogenic pollutants in freshwater and marine ecosystems.

14 LIFE  
BELOW WATER



SUSTAINABLE DEVELOPMENT GOAL 14

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

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U OF T NEWS RELATED TO SDG 14:



November 21, 2019

[More plastic than fish? Business leader and philanthropist Wendy Schmidt talks ocean health at U of T event](#)



November 13, 2019

[Arctic's last refuge for ice-dependent species disappearing as region warms](#)



October 21, 2019

[U of T study reveals building blocks of coralline algae off the coast of Newfoundland and Labrador](#)



August 7, 2018

[U of T scientists draw new connections between climate change and warming oceans](#)

# 15 LIFE ON LAND



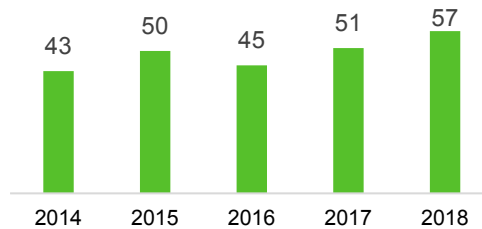
## SUSTAINABLE DEVELOPMENT GOAL 15 – LIFE ON LAND

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

### RESEARCH & INNOVATION:

- The University of Toronto was ranked 66<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG15. With 442 publications between 2009 and 2018
- U of T faculty secured 174 tri-council research grants between 2010 and 2017.

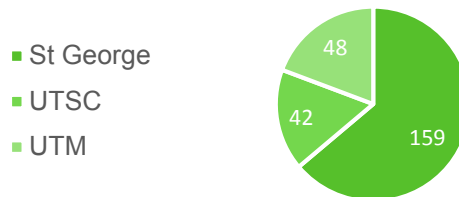
Publications relating to SDG15 by U of T researchers



### TEACHING:

- There are 249 undergraduate courses at the University of Toronto related to SDG15.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG15 at U of T's three campuses



### OPERATIONS:

- There are 34 faculty at the University of Toronto whose work is closely related to SDG15.
- The [Department of Ecology & Evolutionary Biology \(EEB\)](#) at the University of Toronto is one of the largest departments of its kind in North America, with internationally renowned and award-winning faculty.
  - The [Conservation Science Group](#) at the EEB is a collaboration of undergraduate students, graduate students, postdoctoral researchers and faculty interested in conservation science at the University of Toronto.

### OUTREACH & PARTNERSHIP

The [Rollinson Lab](#) work primarily on reptiles, amphibians, and fishes, combining field experiments, long-term monitoring, and metadata to understand the evolution of life histories, maternal effects on body size, temperature-dependent sex determination, phenotypic responses to climate change, and a variety of other topics.

**15** LIFE ON LAND



**SUSTAINABLE DEVELOPMENT GOAL 15**

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

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**U OF T NEWS RELATED TO SDG 15:**



October 9, 2019

[U of T evolutionary biologists track U.S. invasion of herbicide-resistant weeds](#)



October 3, 2019

[U of T-led team text mines over 89,000 scientific papers, revealing new evolutionary insights into ants and plants](#)



August 13, 2019

[Forests for the future: U of T researcher seeks to make trees more resilient amid a changing climate](#)



June 14, 2019

[Plants in Ontario park consume salamanders with 'striking frequency,' U of T and Guelph researchers find](#)

## 16 PEACE, JUSTICE AND STRONG INSTITUTIONS



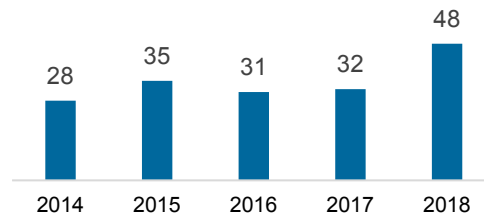
### SUSTAINABLE DEVELOPMENT GOAL 16 – PEACE, JUSTICE AND STRONG INSTITUTIONS

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

#### RESEARCH & INNOVATION:

- The University of Toronto was ranked 8<sup>th</sup> in the world among universities for the volume of scholarly publications related to SDG16. With 294 publications between 2009 and 2018
- U of T faculty secured 227 tri-council research grants between 2010 and 2017.

Publications relating to SDG16 by U of T researchers



A U of T startup, Blue J Legal's AI-powered platforms accurately predict court outcomes and enable you to find relevant cases faster than ever before.

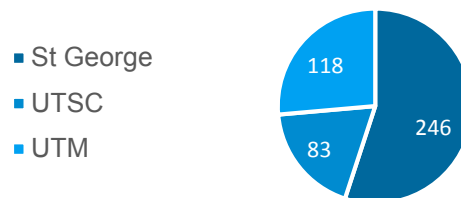


A U of T startup, ROSS Intelligence is a legal research platform that makes your research fast and easy using artificial intelligence.

#### TEACHING:

- There are 447 undergraduate courses at the University of Toronto related to SDG16.
- Browse the course inventory at: <https://www.fs.utoronto.ca/SustainabilityOffice/Resources/SustainabilityCourses>

Courses related to SDG16 at U of T's three campuses



#### OPERATIONS:

- There are 49 faculty at the University of Toronto whose work is closely related to SDG16.
- Each year, the [University of Toronto PBSC Chapter](#) over 120 law student volunteers work in collaboration with community clinics and not-for-profit organizations, courts, tribunals, and academic institutions to deliver high-quality legal services to Canada's most vulnerable communities.



## SUSTAINABLE DEVELOPMENT GOAL 15

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

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### OUTREACH & PARTNERSHIP

The [Trudeau Centre for Peace, Conflict and Justice](#) at the Munk School of Global Affairs and Public Policy is focused on developing future leaders passionate about addressing challenges related to peace, conflict and justice – some of the most important questions of our time. The program provides undergraduates with an interdisciplinary education covering three central pillars: the meanings and causes of peace, conflict and justice; the lived experiences of living in the context of conflict and struggles for peace and justice; and approaches to resolving conflict and producing peace and/or justice.

The Faculty of Law at the University of Toronto offers a range of [Affiliated Centres, Special Programs and Legal Clinics](#) that explore contemporary legal issues and offer students exciting opportunities to expand their legal education.

### U OF T NEWS RELATED TO SDG 16:



January 9, 2020

[U of T Faculty of Law launches Black Future Lawyers program](#)



December 2, 2019

[U of T law students help local startups achieve lift-off through hands-on course](#)



## SUSTAINABLE DEVELOPMENT GOAL 17 – PARTNERSHIPS FOR THE GOALS

Strengthen the means of implementation and revitalize the global partnership for sustainable development

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### RESEARCH, INNOVATION & TEACHING

SDG 17 has a different nature to the other goals with regards to how universities might have an impact. Research and Teaching relevant to SDG 17 is being conducted at the University of Toronto but is challenging to quantify and data based upon SDG17 would not be of statistically significant volumes to warrant analysis.

### TEACHING

The [Mastercard Foundation Scholars Program](#) at the University of Toronto is a comprehensive scholarship that provides talented yet financially disadvantaged students from Sub-Saharan Africa with access to relevant university education. The Program aims to educate and enable students to contribute to the economic growth and social development of their countries of origin.

The [Lester B. Pearson International Student Scholarships](#) at the University of Toronto provide an unparalleled opportunity for outstanding international students to study at one of the world's best universities in one of the world's most multicultural cities. The scholarship program is intended to recognize students who demonstrate exceptional academic achievement and creativity and who are recognized as leaders within their school. A special emphasis is placed on the impact the student has had on the life of their school and community, and their future potential to contribute positively to the global community.

### OPERATIONS

The [Toronto Addis Ababa Academic Collaboration \(TAAAC\)](#) assists Ethiopians in identifying and implementing solutions to some of their nation's most pressing challenges through training and education. This partnership brings together faculty and learners at the University of Toronto (U of T) with colleagues at Addis Ababa University (AAU). Together, they support AAU in preparing the specialist professionals Ethiopia needs, while building upon U of T's commitment to global citizenship and international engagement. By developing and strengthening AAU's graduate medical and academic programs, we are building capacity in Ethiopia to train their own professionals. This will lead to a robust and accessible healthcare system, an improved economy, and pre-empt food insecurity and unemployment. Together, we are building a better future for Ethiopia.

### OUTREACH & PARTNERSHIP

The [Reach Project](#) at the University of Toronto is *“inspired by the 2030 Sustainable Development Goals (SDGs) agenda and, specifically, the assertion that truly inclusive growth can only come when no one is left behind”* and *“The Reach Project is uncovering new and novel insights into global development through its world-class research, and cultivating the next generation of global leadership talent — young leaders equipped with the skills and empowered with the experiences to change the world.”*





## SUSTAINABLE DEVELOPMENT GOAL 17

Strengthen the means of implementation and revitalize the global partnership for sustainable development

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### OUTREACH & PARTNERSHIP (continued)

The [Centre for Global Child Health](#) is the dedicated hub for global child health-focused activities at SickKids. The Centre supports the global agenda for newborn, child and adolescent health through collaborative research grounded in scholarship, sustainable capacity building through education, the use of evidence to inform policy development, and advocacy for improved health for children and families.

### U OF T NEWS RELATED TO SDG 16:



January 19, 2018

[U of T celebrates fifth class of Mastercard Foundation Scholars from sub-Saharan Africa](#)



November 14, 2017

[Strengthening international partnerships: U of T President Meric Gertler in Rwanda and Ethiopia](#)

## Appendix:

### Methodology – key word analysis

For scholarly papers, grants and courses the databases were searched using keywords that are pertinent to each SDG. In the case of the undergraduate course inventory the full methodology is available in the *President's Advisory Committee on the Environment, Climate Change and Sustainability Annual Report 2019*: <https://www.environment.utoronto.ca/wp-content/uploads/2019/08/CECCS-Annual-Report-2019.pdf> see appendix 3.

The methodology described above was adapted for use with searching scholarly papers and grants, but because of the scope of the databases and the different types of data, the search strategy was revised for context and focused results. For example the keyword “water” was found to retrieve many papers and grants that were not related to sustainable development. The process of revising the search strategy was informed by the Sustainable Development Solutions Network (SDSN) report entitled “*Getting started with the SDGs in universities*” ([http://ap-unsdsn.org/wp-content/uploads/University-SDG-Guide\\_web.pdf](http://ap-unsdsn.org/wp-content/uploads/University-SDG-Guide_web.pdf)) and the United Nations SDG website (<https://sustainabledevelopment.un.org/>). The revised search strategy is based the same keywords as used in the course inventory, but with additional context and, where appropriate, additional keywords or phrases. See the table below for the details of the search queries.

### Data sources:

- Scholarly paper counts are from Clarivate Analytics Web of Science (<http://webofknowledge.com>), covering articles published between 2009 and 2018 and document types of: Articles, Reviews, Proceedings papers, Books, and Book chapters.
- Tri-council grants are from U15's Cognit database (<https://cognit.ca>) covering grants from CIHR, SSHRC and NSERC from 2010 to 2017
- Courses are analyzed from the University of Toronto Course Finder (<http://coursefinder.utoronto.ca/>) for the academic year 2019-20.
- Other data in this report come from publicly available reports at the University of Toronto

### Potential shortcomings and known problems

Keyword searching is imprecise and will inevitably both miss some important documents and falsely identify papers that are irrelevant. Best efforts have been made to make a balance between searching inclusively and precisely.

Databases of scholarly research contain biases, reasons include:

- 1- Different fields of study have different publication behaviours, for example: scholars in the biomedical fields publish frequently in journals but social scientists typically publish less frequently and often in books.
- 2- The coverage of the databases of scholarly research cover different subjects and media unevenly and typically over-represent sciences and journals.
- 3- The different media of publication have different traditions with regards to the use of abstracts. However, abstracts will substantially improve the retrieval of the search query, this may lead to an underrepresentation of books and book chapters in the results.

These biases can be problematic, for example: when searching for SDG4 – Quality Education: the search query found many papers in the field of public health related to educational attainment and health outcomes. Although these papers are still of relevance to SDG4, they may be overrepresented in the results.

## Keywords queries used for the analysis of Research Papers

SDG	Short title	Keywords (Web of Science)*
1	No poverty	Query 1: poverty NOT (health or disease or infection) Query 2: poverty and ("socio economic" or socioeconomic or resilience or "income distribution" or "wealth distribution" or disadvantage) Query 3: "social protection" or "extreme poverty" or "entrenched deprivation" or "basic income guarantee" or "poverty eradication" or "poverty line"
2	Zero hunger	Query 1: (farming or food or hunger or hungry or agricultur* or nutrition or nourish* or malnutrition or malnourish*) near/10 (security or insecurity or reserves or resilien* or sustainab*) Query 2: ("crop diversity" or "food produc*" or "agricult* produc*")
3	Good health and well-being	Query 1: (health* or vaccine* or medicin* or malaria or HIV or tuberculosis or hepatitis or immuni*) near/10 (access* or afford* or finance* or poverty* or "low income" or "middle income" or wellbeing or "well being" or "well-being") Query 2: mortality near/2 (neonatal or maternal or child* or premature or rate or suicide or cancer or cardiovascular or "heart disease" or diabetes or "chronic respiratory diseases") Query 3: "Life expectancy" or "universal health*" or "World Health Organisation" or "major disease*" or "tropical disease*" or "communicable disease*" or "non-communicable disease*"
4	Quality education	Query 1: (educat* or numeracy or literacy or illiterate or pedagog* or schooling) near/10 (inclusi* or equality or equit* or "primary school" or quality or marginali* or participation or "childhood") Query 2: "lifelong learning" or "life-long learning" or "proficiency standards" "early childhood development"
5	Gender equality	Query 1: (gender or woman* or women* or girl* or female*) near/5 (equality or equity or marginali* or parity or pay or salary or salaries or discriminat* or exploit* or empower* or disadvantag* or dignity or violence or "labo\$r force" or "work force" or leadership or managerial or inequity or inequality or underrepresent* or "under represent*" or representation or diversity or "domestic violence") Query 2: ("Sexual and reproductive health" or "Sexual exploitation" or "Sexual violence" or "child marriage\$" or "gender quota" or "female genital mutilation" or "intimate partner violence" or prostitution)
6	Clean water and sanitation	Query1: ("clean water" or "drinking water" or "fresh water" or freshwater or wastewater or "waste water" or "water quality" or sanitation or "water supply" or "water treatment" or "wastewater treatment" or "water security" or "water resource\$ management" or sewer* or greywater)

7	Affordable and clean energy	<p>Query 1: ((energy or fuel* or electricity) near/3 (renewable or sustainable or clean or affordable or "low carbon" or reliable or "green house gas emissions" or "greenhouse gas emissions")) not ("small cell network*" or "Distributed Antenna Systems")</p> <p>Query 2: ("wind power" or "solar power" or "hydro power" or "renewable power" or hydroelectric or "hydro electric" or "green energy" or "sustainable energy" or geothermal or "energy intensity" or "Clean* fossil fuel technology" or "wave power" or "wind turbine" or "energy innovation" or Energiewende)</p>
8	Decent work and economic growth	<p>Query1: (employment or jobs or labour or labor or worker\$ or wage\$ or unemployment or prosperity) near/5 (sustain* or development or productivity or inclusive or decent)</p> <p>Query 2: "economic growth" or "economic development " or "labor productivity" or "labour productivity" or "GDP growth" or "GDP per capita" or "economic productivity" or "aid for trade" or "decent job*" or "decent work" or "quality job*" or "living wage" or "minimum wage" or "precarious employment"</p>
9	Industry, Innovation and infrastructure	<p>Query 1: ("infrastructure" or "industrialization" or "manufacturing" or "internet access" or "broadband" or "mobile connectivity") near/15 (sustainable or inclusive or "economic development" or "economic growth" or "developing countr*" or "developing nation\$")</p> <p>Query 2: ("scientific research" or "research and development" or "R&amp;D" or innovation or entrepreneur* or "creative industr*" or "creative economy" or "service industr*" or "service economy" or tourism) and ("economic development" or "economic growth" or "developing countr*" or "developing Nation\$")</p> <p>Query 3: ("Industrial diversification" or "sustainable transport*" "sustainable transit" or "public transit infrastructure" or "public transport* infrastructure" or "infrastructur* development" or "infrastructur* investment" or "infrastructur* construction" or "belt and road" or "transborder infrastructur*")</p> <p>Query 4: Query #1, #2, and #3 NOT "health**"</p>
10	Reduced inequalities	<p>Query 1: (("international trade" or "world trade" or "free trade" or "trade barrier" or inequalit* or equalit* or "equal opportunity") near/15 ("developing countr*" or "developing state*" or "developing nation*" or financ* or econom* or socioeconom* or income)) not health</p> <p>Query 2: ((tariff or tax or taxation or "duty free") near/15 ("developing countr*" or "developing state*" or "developing nation*" or "economic development")) not health</p> <p>Query 3: ("income disparity" or "affordable housing" or "gini index" or "gini coefficient") not health</p>
11	Sustainable cities and communities	<p>Query 1: (Urbani\$ation or City or Cities or urban or slum\$) and (resilien* or sustain* or inclusiv* or "particulate matter" or "public transport" or "public space" or "green space" or "waste management" or "waste collection" or access* or pollution or "climate change")</p> <p>Query 2: ("Affordable housing" or "Sustainable communit*" or "Sustainable building*" or "gentrification")</p>

12	Responsible consumption and production	<p>Query 1: ((production or waste or "natural resources") near/5 (recycl* or sustainable or efficien*)) not (health or metabol*)</p> <p>Query 2: "sustainable design" or "industrial ecology" or "industrial waste" or "toxic waste" or "material consumption" or "sustainable consumption" or "green consumption" or "sustainable tourism" or "fossil fuel subsid*" or "sustainability report\$"</p>
13	Climate action	<p>Query 1: (climate) near/5 (change or extreme or weather or warming)</p> <p>Query 2: "global warming" OR "greenhouse gas*" OR "Climate action" OR "Climate mitigation" OR "Climate related hazards" OR "Extreme weather" OR "Ocean warming" OR "Sea level rise" OR "Rising sea level" OR "Green Climate Fund" OR "Climate finance" OR "climate adaptation"</p>
14	Life below water	<p>Query 1: (ocean\$ or marine or sea\$ or coastal or coast or mangrove) near/15 (sustain* or conserv* or ecosystem* or pollution or biodiversity or eutrophication or Deoxygenation or warming or hypoxia or "dead zone" or acidification)</p> <p>Query 2: "coral bleaching" or "unregulated fishing" or "sustainable fishing" or overfishing or "over fishing" or "fisheries management"</p>
15	Life on land	<p>Query 1: (forest* OR wetland* OR mountain* OR dryland* OR "fresh water" OR freshwater OR wildlife OR desert*) near/10 (biodiversity or ecosystem or ecology or sustain* or conserv* or "land use")</p> <p>Query 2: "terrestrial ecosystems" or desertification or "land degradation" or "invasive species" or "invasive alien species" or "cropland expansion" or "Red List Index" OR "Nagoya Protocol on Access to Genetic Resources" or "deforestation" or "degraded forests" or "afforestation" or "reforestation" or "sustainable forest management" or "degraded land" or "degraded soil" or "mountain green cover index" or "poaching" or "trafficking of protected species" OR "illegal wildlife products" or "Ecosystem restoration" or "threatened species" OR "extinct species"</p>
16	Peace, justice and strong institutions	<p>Query 1: (justice or governance or peace or democra* or crime or criminal or legal or judicia* or corrupt*) near/10 (institution* or accountable or transparent or inclusive or open)</p> <p>Query 2: "arms trafficking" or "illicit arms trade" or "hate crime" or "Human trafficking" or "Illegal arms" or "Justice for all" or "Organized crime" or "false confession" or "torture" or "armed conflict\$" or "civil conflict\$" or "peacekeeping" or "Geneva Convention" or "genocid*" or "homicid*" or "effective rule of law" or "fundamental freedom\$" or "peaceful society" or "independent judiciary" or "child trafficking" or "bribery" or "voting right\$" or "right to vote"</p>
17	Partnerships for the goals	<p>Query 1: ("world bank" or ODA OR "official development assistance" OR "private investment" OR "economic imbalanc*" OR "Foreign direct investment\$" OR FDI OR "World Trade Organization" or WTO OR "public debt" or "public private partnership\$" or "bilateral investment" OR "access to the internet" or "international cooperation" or "international aid" or "civil society partnership\$")</p>

		Query 2: "SDG17" or "Enhanced international cooperation " or "Doha Development Agenda" or "Global partnership for sustainable development"
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\* The keywords for search the Cognit database were based on the Web of Science keywords but the Boolean search operators were modified for compliance with the search engine rules.