Mapping Research Publications to the UN SDGs

A study of one approach and what it can teach us

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Agenda

- Mapping research to the SDGs
- Evaluating SDG research

Mapping research to the SDGs

Challenges and an evolving approach

United Nations SDGs – What are they?

- **The 17 UN SDGs** are a set of goals developed to replace the Millennium Development Goals (MDGs) and were adopted by all UN member states in 2015 as part of the [2030 agenda for Sustainable Development](#)

According to the [United Nations:](#)

"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."
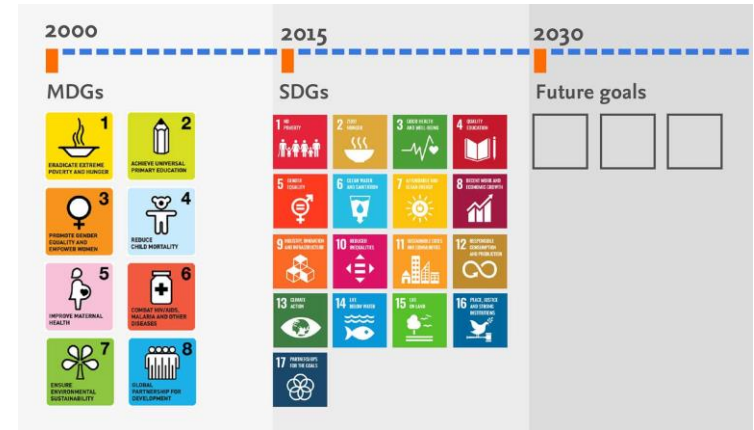
Research lives upstream of the goals
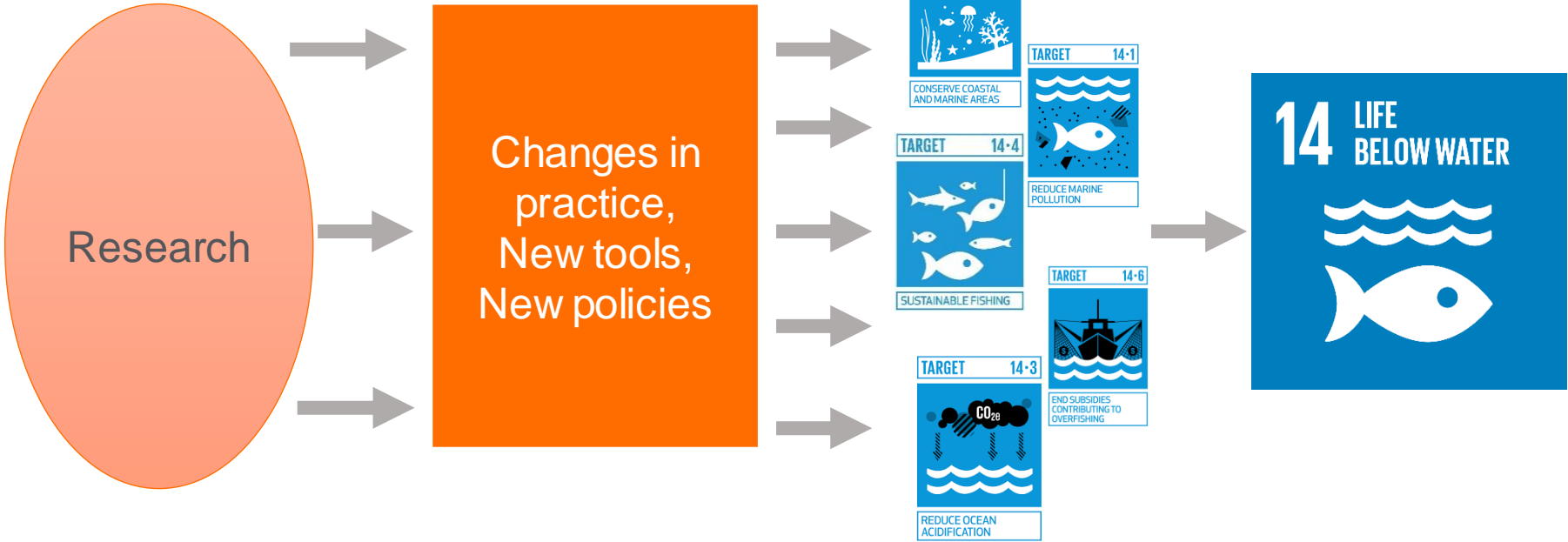
Sustainability research: a starting point

- 2015 Report
- Collaboration with SciDev.Net
- Six key themes that encompass the 17 SDGs
  - *Dignity*
  - *People*
  - *Prosperity*
  - *Planet*
  - *Justice*
  - *Partnership*

United Nations SDGs and Elsevier

"It is our goal to do everything we can to ensure that our unique strengths in content, data, and analytics help researchers and health professionals make the targets set by the United Nations in 2015 a reality."

Kumsal Bayazit
CEO, Elsevier

Elsevier Sustainability Hub: Using data to drive action on the UN SDGs

https://www.elsevier.com/connect/sustainability-science-hub

The Power of Data
to Advance the SDGs
Mapping research for the Sustainable Development Goals

Lessons learned:
It's better to start and plan to iterate

*"The SDG agenda is extremely important and **the University of Southern Denmark (SDU) welcomes Elsevier's efforts** to deliver Scival tools extracting research publications relevant for different SDGs. This is one approach to help both researchers and research managers in gearing their work towards the unified goals defined by UN. **SDU urges further work to develop more accurate next-generation tools to map research to SDGs**."*

— Maeva Vignes, Funding Advisor,
[University of Southern Denmark Research & Innovation Organisation (SDU RIO)](#)

Lessons learned:
Provide the means to be critiqued

- On Mendeley data we uploaded:
- The full Scopus query for each SDG
- The query development methodology documentation for each SDG
- Download them for free from Mendeley: http://bit.ly/sdgdocs

Lessons learned:
SDG Queries generate highly variable results

→ Venn diagrams showing the overlap between four different queries when assessing research from University of Southern Denmark
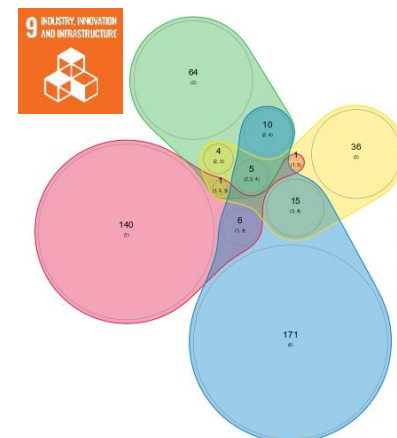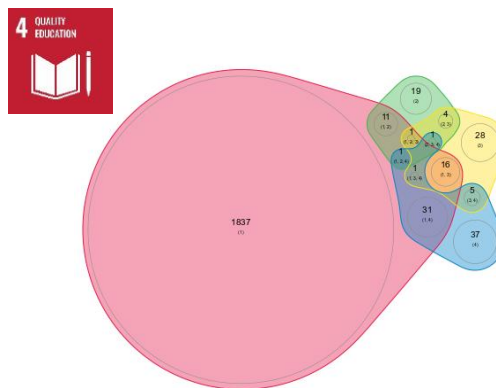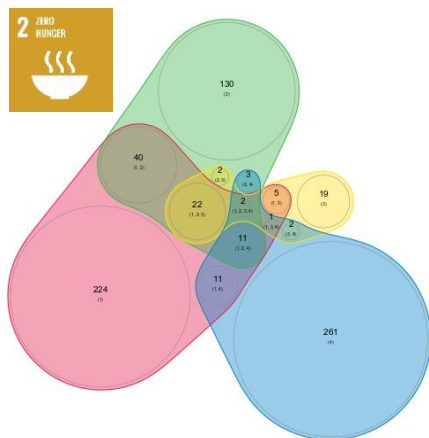
→ No more than 20% of common publications for the different queries related to a given SDG

"SDU" queries

SciVal queries

AURORA queries

Austrian queries

Solutions:

1. Count as many opinions as possible: crowd-source the creation of a database of research mapped to SDGs.
2. Invest more time in the creation of more detailed queries.
3. Partner with others in the field to improve the SDG publication sets.

Matching research to SDGs

https://sdgresources.relx.com/match-research-to-sdgs

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https://sdgresources.relx.com/match-research-to-sdgs

1 NO POVERTY

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

4 QUALITY EDUCATION
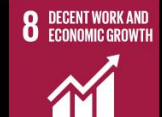
Here's how to help:

1. Click *Match to indicators* for any publication in the list below or upload your own publications.
2. Review the information about the publication and the list of targets and indicators relevant to the SDG.
3. Select the indicators that you believe apply to this publication or click *Not applicable* at the bottom of the page.
4. Click *Submit feedback*.
5. Select another publication to review.

Selected publications	Upload publications

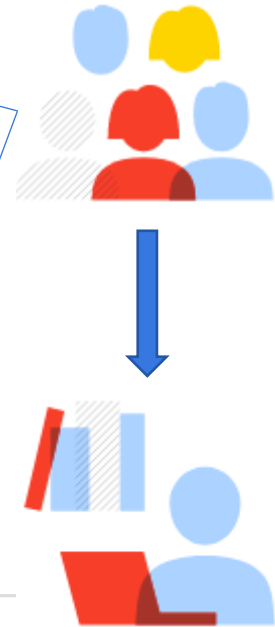|		
Fianu S., Davis L.B. (2018). **A Markov decision process model for equitable distribution of supplies under uncertainty.** *European Journal of Operational Research*	14 citations	Match to indicators
Conti R.M., Bach P.B. (2014). **The 340B drug discount program: Hospitals generate profits by expanding to reach more affluent communities.** *Health Affairs*	28 citations	Match to indicators
Clark B.L., Hou J., Chou C.-H., Huang E.S., Conti R. (2014). **The 340B discount program: Outpatient prescription dispensing patterns through contract pharmacies in 2012.** *Health Affairs*	5 citations	Match to indicators
Brooks J. (2014). **Nursing typhus victims in the Second World War, 1942-1944: A discussion paper.** *Journal of Advanced Nursing*	2 citations	Match to indicators

Refining the SDG queries

- Subdividing the SDGs into research areas based on the targets and indicators
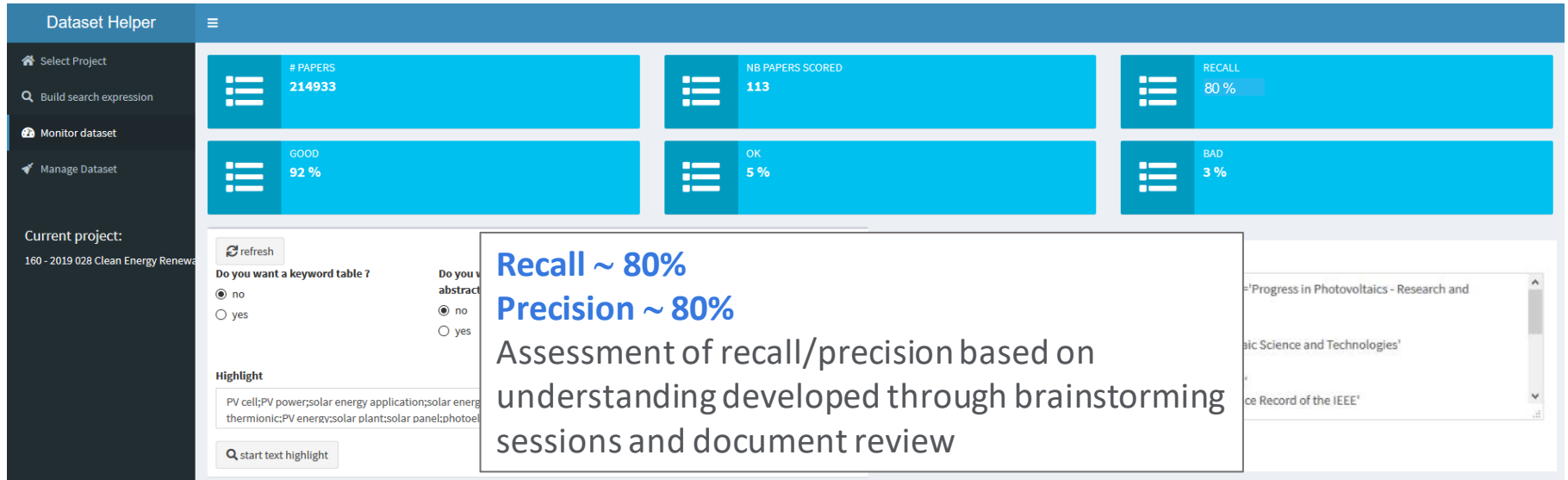
Refining the SDG publication sets

- **Step 1: Query Helper** created to **standardize** and ease top-down approaches to the creation of custom thematic datasets using keyword-based queries (starting from a definition to uncover relevant terminology)

- **Step 2:** Expansion through **machine learning**

Recall ~ 80%
Precision ~ 80%
Assessment of recall/precision based on understanding developed through brainstorming sessions and document review

SDG Research Matching Initiative

Challenge:
To improve the document to SDG mapping using machine learning and query improvement techniques and get buy-in from the larger research community

- Partnership with:
- Aurora Universities Alliance (represented by Vrije Universiteit Amsterdam)
- Auckland University
- Southern Denmark University

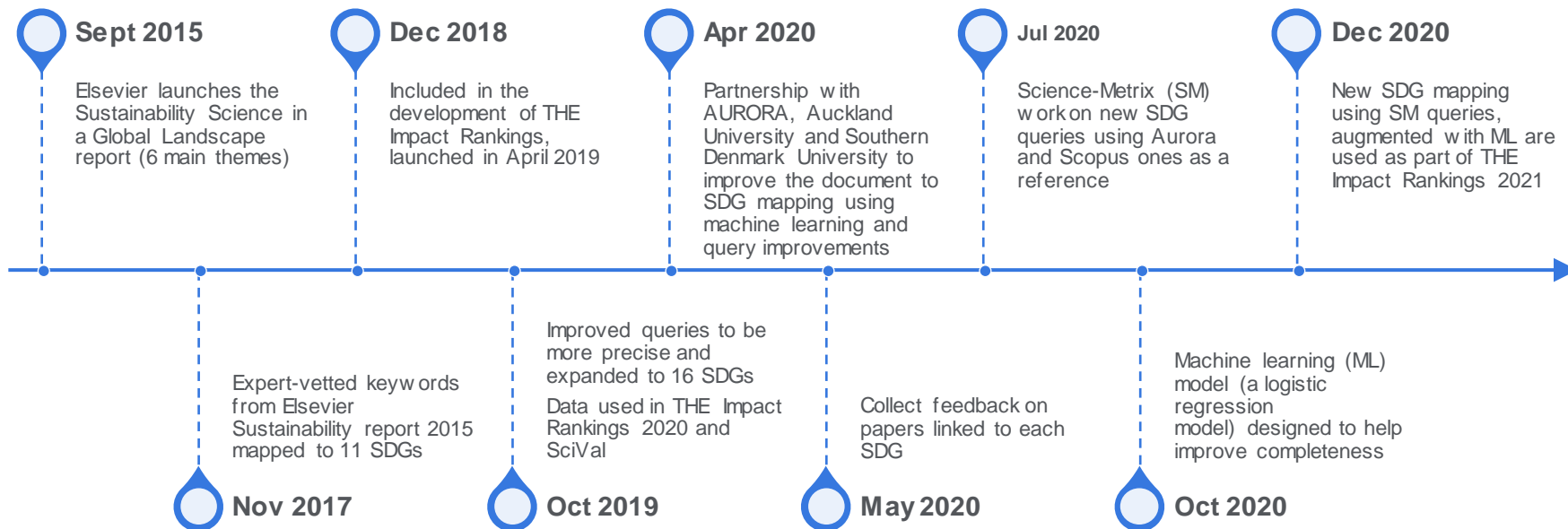Full details are available online:
https://www.elsevier.com/about/partnerships/sdg-research-mapping-initiative

Development of the SDG queries

Sept 2015

Elsevier launches the Sustainability Science in a Global Landscape report (6 main themes)

Dec 2018

Included in the development of THE Impact Rankings, launched in April 2019

Apr 2020

Partnership with AURORA, Auckland University and Southern Denmark University to improve the document to SDG mapping using machine learning and query improvements

Jul 2020

Science-Metrix (SM) work on new SDG queries using Aurora and Scopus ones as a reference

Dec 2020

New SDG mapping using SM queries, augmented with ML are used as part of THE Impact Rankings 2021

Expert-vetted keywords from Elsevier Sustainability report 2015 mapped to 11 SDGs

Nov 2017

Improved queries to be more precise and expanded to 16 SDGs

Data used in THE Impact Rankings 2020 and SciVal

Oct 2019

Collect feedback on papers linked to each SDG

May 2020

Machine learning (ML) model (a logistic regression model) designed to help improve completeness

Oct 2020

SDGs in SciVal

Understand and analyze your contribution to the UN SDGs

UN SDGs in SciVal – the free layer

scival.com/sdg

Use case 1 – Identifying key institutions and experts to facilitate team building for targeted funding bids in fields related to the UN SDGs

Use case 2 – Identifying Topics contributing to the UN SDGs for further analysis

Use case 3 – Identifying Topics that institutions are contributing to the UN SDGs for further analysis

Thank you

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