Sustainable Development Goals Interface Ontology (SDGIO)

Progress

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Knowledge representation and Ontology

Ontology: a machine-readable representation of human knowledge which can be used to guide information and data mobilization and analysis
- Knowledge rendered as a logically coherent network of meaning
- Clarify the meaning of concepts within/between disciplines

Some motivating reasons for developing an ontology
- Externalize a common understanding of the structure of information allowing sharing among people or software agents
- Enable reuse of knowledge within/between domains/disciplines
- Make assumptions and terminological ambiguity explicit, enabling structured interventions and traceable updates
- Enhance discovery, mobilization and analysis of domain knowledge

Knowledge representation and Ontology

The team building SDGIO aims to capture the existing definitions (i.e. semantics) of terms in the SDG domain in SDGIO

- Meanings will not be changed
- Meanings are being expressed with respect to a core set of universal terms (such as *process, role,* and *entity*) to help control the semantics such that machines can act on SDG knowledge
- Core terms are defined in the Basic Formal Ontology

SDGIO Progress

Mandate:
The IAEG-SDG in its 2nd meeting (Bangkok, October 2015) requested UNEP to develop the SDG Interface Ontology (SDGIO)

Three major updates

- PURL's for Sustainable Goals, Targets and Indicators
  ➢ Information provided to the Working Group on Document Standards during their Kick-Off Meeting in NY 22 March 2018
- SDGIO registered in online lookup services (OntoBee and EBI OLS), easing programmatic access to content
- 5 United Nations Online Volunteers parse UN documents and add new content to SDGIO

PURL's for SDGs, targets , and indicators

8.9.1 Tourism direct GDP as a proportion of total GDP and in growth rate

Each goal, target, and indicator has its own PURL e.g. http://purl.unep.org/sdg/SDGIO_00020107

...which links to metadata and other content in SDGIO

Annotations +

rdfs:label
Tourism direct GDP as a proportion of total GDP and in growth rate

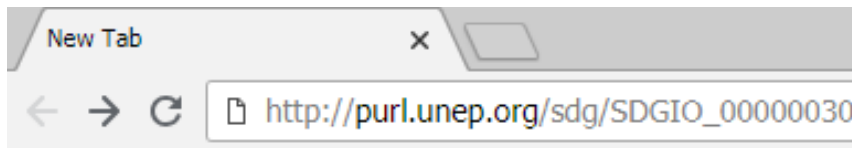'UN SDG Indicator ID'
8.9.1

'UNSD SDG indicator code'
C080901

http://sdgio.unep.org:9999/

PURL's for SDG-relevant concepts

8.9.1 **Tourism** direct GDP as a proportion of total GDP and in growth rate

The term Tourism in SDG Indicator 8.9.1 includes content needed for machines to understand what the goal/target/indicator is about

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PURL's for SDG-relevant concepts

8.9.1 **Tourism** direct GDP as a proportion of total GDP and in growth rate

New Tab ✕

http://purl.unep.org/sdg/SDGIO_00000030

Environment Live ✕

Secure | https://uneplive.unep.org/ontology/index/SDGIO_00000030

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tourism

ID: SDGIO_00000030
Name: tourism
                       \"visitor\" to be represented: a human which has role visitor with WTO definitions
Definition: A process in which a visitor travels to and stays in places outside their usual environment for
                       not more than one consecutive year for leisure, business and other purposes. All the activities
                       performed by the visitor in preparation for and during their trip are parts of this process
Comment: Adapted from the definition used by the World Tourism Organization

UN environment

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SDGIO registered in OntoBee and EBI OLS semantic lookup and integration services

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SDGIO registered in OntoBee

Allows advanced access and visualization

Class: access

Term IRI: http://purl.unep.org/sdg/SDGIO_00000007

Definition: A disposition that inheres in a person or population who bears the ability, right, and permission to

+ entity
   + continuant
      + specifically dependent continuant
         + realizable entity
            + disposition
               - function
               - ability to access
               - permission to access
               + risk
               - hazard disposition
               + vulnerability
               - resilience to hazards
               - water-borne disease
               - resilience
               - inclusiveness
               - access
                  - access to basic services

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SDGIO in EBI OLS

Allows advanced access and visualization

ecosystem service (http://purl.unep.org/sdg/SDGIO_00010072**)**

> A service in which an ecosystem, usually natural, provides benefit to the
> well-being of human service
> consumers.

EBI OLS

http://sdgio.unep.org:9999/
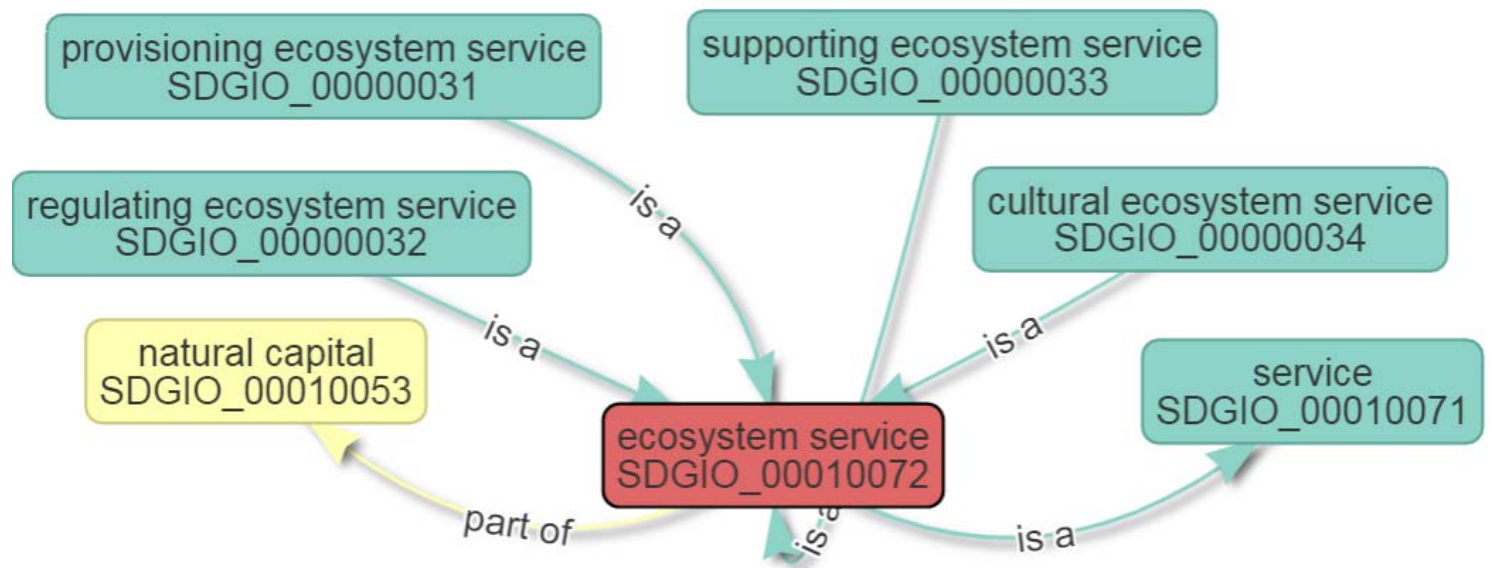
Defining New SDG terms

- Recruitment of 5 UN Online Volunteers who work on adding new terms and their definitions to the SDGIO

  - ➢ Search UN documents for key concepts underlying a maximum of three Sustainable Development Goals
  - ➢ Identify new terms and their definitions related to the SD Goals
  - ➢ Create a discussion page per term in the SDGIO Community of Practice under the Community Discussion for our ontology team to revise and encode in the SDGIO system

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SDGIO Community of Practice

- A place holder for resources required by the Volunteers
- A place to have the newly identified terms by creating a discussion page per term
- Used for the Peer review of the previously identified terms and agreed definitions
- To be used for the peer review of the newly identified terms

If you would like to contribute, please register in the Community of Practice using the following link:
https://communities.unep.org/signup.action

SDGIO Usage and Development

- **India:** A data system commissioned by State of Karnataka is using SDGIO to link and mobilise data about SDG 8 (Decent work and economic growth)
  - ➢ Processes and other entities specific to this region are being added to SDGIO, to allow local and global understandings to be better integrated
- **Germany:** A Helmholtz-funded project, INTERNAS
  - ➢ Linking and analysing knowledge transfer between international biodiversity mainstreaming efforts (e.g. IPBES) and national processes in different sectors
- **Japan**: Through a project organised through the Japan Database for Life Sciences BioHackathon series
  - ➢ Ecosystem services (e.g. forest bathing) are being captured in SDGIO and ENVO, the environment ontology

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More information

- A list of references can be found at:
  https://tinyurl.com/sdgioRefs

- Development is open on GitHub:
  https://github.com/SDG-InterfaceOntology/sdgio

- Upcoming presentations at:
  - ➢ SciDataCon
  - ➢ International Data Week conference (Gaborone, Botswana)

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SDGIO outlook

Development plan

- Continue to expand SDGIO with new knowledge from across stakeholder groups

- Express regional and sub-regional understandings of the SDGs, targets, and indicators in a harmonized way to allow semantically accurate data mobilization

- Seek and support new use cases to apply SDGIO in reporting and monitoring solutions

Core SDGIO working team

Ontology experts

- Pier Luigi Buttigieg (Alfred-Wegener-Institut, Helmholtz Zentrum für Polar und Meereforschung)
- Ramona L. Walls (Cyverse)
- Chris Mungall (Lawrence Berkeley National Laboratory)

Online Volunteers

- Enrique Valencia Lopez
- Jaime Ali
- Lise Cazzoli
- Maria del Pilar Rodriguez
- Sinéad Jones

UN Environment

- Dany Ghafari
- Ludgarde Coppens
- Diana Ngina

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Thank you

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Ludgarde Coppens/ Science Division / SDG and environment Statistics unit

https://environmentlive.unep.org/statistics

https://environmentlive.unep.org/sdgpolicybrief

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