

PLACARD Development Note: CCA & DRR taxonomies



by Julia Barrott, July 2020

Introduction

Being able to access and use data, information and knowledge is essential to our being able to learn from others, to understand a subject area, to know what the latest technologies and approaches are, to know who is doing what and where, and to making informed decisions. Information and knowledge management may not be the most exciting of topics, but it is absolutely central to ensuring that people can find, access and use the data, information and knowledge that they need.

Why we developed CCA and DRR taxonomies

The PLACARD - [PLAatform for Climate Adaptation and Risk reDuction](#) - project set out to increase and enhance communication, coordination and collaboration between the climate change adaptation (CCA) and disaster risk reduction (DRR) communities. This is needed as although these communities both take actions to reduce the impacts of climate change and can learn a lot from each other, they do so through from different perspectives and through different frameworks and actors. They also use and apply the same terms differently, resulting in confusion for non-experts and experts from the other community alike.

In PLACARD we recognised that, as well as bringing these two communities together face-to-face, we needed to lay the foundation for better connections and integration of their knowledge. This would enable them to be more aware of each other, to better understand each other, and make it easier to identify and explore overlapping agendas and opportunities for collaboration.

One way of doing this was to better link the knowledge shared on the major knowledge sharing platforms serving these communities. These platforms, like weADAPT.org which we manage, use keywords to 'tag' and connect content. However, they do so using different collections of terms for the keyword tags, sometimes using different terms to mean the same thing.

To connect this knowledge in a coherent way we needed to develop a harmonised system that connects the disparate language used by the different platforms. We also needed to help people engaging with this knowledge better understand the subject matter and how these two communities interpret different terms. To do this we wanted to annotate all the terms used as keyword tags with 'metadata' - data about the data, including definitions, notes on how the term is used, what other terms it relates to, and what other words are used to mean the same thing (synonyms).

The taxonomies produced are the product of this work. They will be integrated into the **PLACARD Connectivity Hub**, which demonstrates how using shared taxonomies can help connect currently siloed knowledge from across different platforms and communities in engaging and efficient ways that also support learning and collaboration.

The development of these taxonomies sets the stage for transformative IKM for climate action. Read more about this in our paper "[Transforming knowledge management for climate action: A road map for accelerated discovery and learning](#)" and [concept note for the development of a Climate Action Knowledge Graph](#).

Using the taxonomies

These [taxonomies can be downloaded in .xlsx here](#). They are also available in RDF - please get in touch with us for access to this file type. Note that these are living entities that will continue to be built upon and improved. For more information and enquiries about collaborating in this effort please contact Julia Barrott (julia.barrott@sei.org) and Sukaina Bharwani (sukaina.bharwani@sei.org).

Method: How the taxonomies have been developed

We define a taxonomy as a controlled collection of terms arranged into a hierarchical structure that describes a particular knowledge domain. In this work we set out to develop and cross-link two taxonomies: one on climate change adaptation and the other on disaster risk reduction. These taxonomies aim to describe these domains, encapsulate the main terminology they use, and to provide rich metadata to support understanding and learning.

These taxonomies have been developed using the [PoolParty Semantic Suite](#) developed by [Semantic Web Company](#), and with the support of the [Renewable Energy and Energy Efficiency Partnership](#). We are grateful to Martin Kaltenböck and Denise Recheis for all of their help and the value they have added to this work.

Data sources

Terms (concepts), definitions and metadata were elicited from:

- Keyword tags used in the knowledge platforms participating in the [PLACARD Connectivity Hub: Climate-Adapt, PreventionWeb, ELDIS, BRIDGE, weADAPT](#).
- weADAPT editors (subject area experts)
- [UNDRR terminology](#) (2017)
- [IPCC Special Report](#) (2018): Global Warming of 1.5 °C - [Glossary](#)
- [IPCC SREX](#) (2014): Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation
- [E-learning course on DRR & CCA](#) developed by HEKS/EPER, Caritas Switzerland, HELVETAS Swiss Intercooperation, Global Risk Forum Davos and Zoï Environment Network for the Swiss NGO DRR Platform. Module 1: [Basic definitions and concepts](#).
- Existing taxonomies:
 - [Climate Tagger](#)
 - [Caribbean Community Climate Change Centre](#) (CCCCC) Taxonomy for Climate Change Information
 - [IPCC Fifth Assessment Report](#) (2014), [Topic 4: Adaptation and Mitigation](#), Table 4.2.

Process

Identifying terms: terms were initially selected for inclusion in the taxonomies based on their frequency of use, significance (both for outlining key subtopics, e.g. “national adaptation planning”, and with regards to good practice, e.g. “social equity”). Some terms have been added to help provide a logical structure, for example “adaptation and mitigation”. Later term additions focused on providing more detail and were selected to provide reasonable representation of the relevant area/subtopic. These were added through expanding the taxonomy branch by branch once the main structure was set.

Structuring the hierarchy: the most significant challenge to developing these technologies was deciding on the hierarchical structure or framework upon which to build the taxonomy. How a knowledge domain should be organised to best represent the subject matter at hand is a matter of perspective and there is no one structure that will satisfy all needs. With these taxonomies, we aimed to provide structures that provide an overview of the fields of CCA and DRR, and which could house the large array of focused working areas and their associated terminology. These structure were based on the key topic areas existing in these fields, typologies used in high-level documentation (for example the IPCC reports), the definitions of terms (and additional notes, for example those included in the [UNDRR terminology](#)), consultation with subject matter experts, existing library/content structures used on relevant platforms, existing taxonomies (see source list), and existing knowledge of the subject area amongst the team (and reflecting long-term experience in knowledge management). This structure is a starting point and something to be further discussed and developed in collaboration with the wider CCA and DRR community.

Synonyms (Alternative Labels): ‘Alternative Labels’ for terms were added based on an analysis of the keyword tags coming from the knowledge platforms participating in the PLACARD Connectivity Hub. ‘Alternative Labels’ enable the addition of multiple synonyms for terms. This enabled harmonisation between some of the terminology used within and across the platforms and glossaries (see Box 4, p 28 of “[Transforming knowledge management for climate action: A road map for accelerated discovery and learning](#)”). This work is not exhaustive. Further additions of synonyms would benefit from input from subject matter experts.

Definitions: definitions were added for the most significant and frequently used terms. Where definitions differ between the CCA and DRR communities both definitions were included and labeled accordingly to aid users to understand these disparities in the interpretation of terms. For the DRR taxonomy definitions are predominantly sourced from the [UNDRR Terminology](#) (2017). For the CCA taxonomy definitions are largely sourced from glossaries provided in the [IPCC Special Report](#) on Global Warming of 1.5 °C (2018) and the [IPCC Fifth Assessment Report](#). Additional definitions were taken from the IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX, 2014), and topic-specific publications of global credibility, for example the definitions used for ‘Nature-based Solutions’ come from the 2016 IUCN World Conservation Congress and the European Commission's report “Towards an EU Research and Innovation Policy Agenda for Nature-based Solutions & Re-naturing Cities - Final Report of the Horizon 2020 Expert Group” (2015). Where there are various definitions available and still being debated more than one definition is provided, to represent the differing views.

Scope Notes: these notes provide contextual information on the usage of the term, how this has evolved through time, any ongoing debates, examples of how it is used, and in some cases, how it should not be used. These notes are not yet available for all terms. The development and inclusion of these notes prioritised terms that are known to be problematic in that they are new and still being developed as a concept, are/remain highly debated, are frequently interpreted in different ways (and with significant implications), and/or are difficult concepts for non-experts to grasp. Where available, scope notes for the DRR taxonomy comprise the additional “Annotation” notes available under each term in the UNDRR Terminology. For other terms Scope Notes were developed by the team at SEI’s Oxford Centre working on the PLACARD Connectivity Hub; these are denoted “PLACARD annotation”.

Hidden Labels: common misspellings and infrequently used variations of terms (for example, “adaption” in place of “adaptation”) have been included in the taxonomy as Hidden Labels. This work is only in its early stages.

Related Concepts: terms have been related to one another where they are closely linked in usage or are otherwise relevant to one another. For example, “nature-based solutions” has “NbS approaches” and “ecosystem services” as narrower concepts (each with multiple narrower concepts based on Based on IUCN’s “[Nature-based solutions to address global societal challenges](#)” (2016)), and “ecosystem management”, “ecosystem-based adaptation”, “ecosystem-based options”, “nature inclusive design”, and “urban ecosystems” as Related Concepts. In general, these Related Concepts do not sit under nature-based solutions (they are not, as currently included in this taxonomy, categorised as nature-based solutions or a component of the same), but if you were to talk about any one of them it would be natural to also think about nature-based solutions. These relations, of which there are many in the taxonomy, better enable discovery of related material when the taxonomy is applied in a system for keyword tagging. They have been assigned based on existing knowledge of the subject area, the reference glossaries (which often contain “also see <term>”), and scope notes and definitions (which often mention other terms).

Practices followed: all the terms are included in lower case unless there is a specific convention to do otherwise (for example IPCC is included in upper case).

Limitations and remaining work

These taxonomies contain over 600 terms and so lay a good foundation for future work. However, there are many areas where they can be improved and extended.

Many subtopics within CCA and DRR (e.g. Community-based Adaptation) are highly complex and have large vocabularies that express this. While some of this is captured in the current taxonomies, much of the structure has purposely been kept ‘flat’ (all on the same level or tier in the hierarchy) so as to not misrepresent relationships between terms. Some subtopics remain underdeveloped while others will soon need updating as new criteria and standards are put forward (for example, the Global Standard for Nature-based Solutions (IUCN, 2020)). The development of these subtopics needs to be done in consultation with subject matter experts.

The taxonomy for CCA is better developed than that for DRR. This reflects the subject knowledge of the taxonomy development team, who specialise in CCA. In particular, the DRR taxonomy needs further development to include the social aspects of DRR and related policy. A starting point here are the themes and categories used in [PreventionWeb](#).

Not all of the existing keyword tags used in the knowledge platforms participating in the PLACARD Connectivity Hub are included. This is due to (a) the large number of terms (>5000 keywords for the combined platforms), (b) the number of duplicate terms (misspellings, different hyphenation, synonyms), and (c) some of the keywords being locations or otherwise too detailed and context-specific for a general taxonomy. These platforms (and other not yet included) are valuable sources of user-contributed terms. The analysis and inclusion of keyword tags coming from knowledge platforms warrants further consideration.

Not all of the entries in the relevant glossaries are included. Where terms are not included it is typically because that term belongs to another knowledge domain, for example climate science, or ecology and biodiversity conservation. Some terms have not yet been included as it is not clear where they should fit within the taxonomies. This is an ongoing area of work and something that can be significantly improved through linking these taxonomies with additional taxonomies specific to related areas of concern (e.g. climate science).

Due to the complex and interrelated nature of CCA and DRR and their subtopics, many terms appear in more than one location within the hierarchical structure. While this is not good practice for the development of a taxonomy, it is important for ensuring these concepts are organised in a way that reflects how they are used. This needs further review by subject experts. A way to improve on this situation is the development of an ontology for DRR and CCA. Ontologies enable additional categorisation of- and assignment of attributes to terms that would circumvent needing to include them in multiple locations. This is a key element in the [road map for accelerated discovery and learning](#).

While these taxonomies have been developed with reasonable knowledge of the subjects at hand and have been reviewed by experts, this review has not been comprehensive. These taxonomies provide useful tools for immediately improving information and knowledge management, and a springboard for these communities to think on and discuss how language is used and how areas of work within these communities are, can and should be connected. To maximise their efficacy, credibility, legitimacy and uptake they should be regularly reviewed by experts.

Next steps

As mentioned above, these taxonomies comprise a useful starting point for building comprehensive CCA and DRR taxonomies. However, as also mentioned, there is much that can be improved. If taken forward and developed, these taxonomies can provide a foundation for building a [Climate Action Knowledge Graph](#) that truly transforms our ability to find, access, and use knowledge in CCA and DRR, which in turn would empower us to better leverage the huge potential offered by artificial intelligence applications.

The [road map for accelerated discovery and learning](#) outlines how this can be done. Key elements include:

- linking and integrating with existing relevant taxonomies, controlled vocabularies and thesauri (for example, [AGROVOC](#)), in support of Linked Open Data;
- text mining of relevant, credible documents that encapsulate the evolving CCA and DRR landscape (for example, the IPCC Special Report on Climate Change and Land)) to elicit further relevant keywords for inclusion in the taxonomies;
- developing an ontology to provide an additional layer of information on the terms, including their classification, attributes and relationships with one another; and, most importantly,
- iterative and ongoing collaboration with other knowledge managers and subject matter experts in CCA and DRR and their subtopic communities.

There are numerous databases and existing taxonomies and ontologies that can provide a source of additional terms and more comprehensive metadata. Many can be found through:

- UN Resources Library - Terminology databases: <https://research.un.org/en/un-resources/terminology>,
- UNTERM: <https://unterm.un.org/unterm/portal/welcome>, and
- Basel Database of Thesauri, Ontologies and Classifications: <https://bartoc.org/>

Additional languages

One of the most important next steps for connecting relevant content that may otherwise not be found and for promoting equitable access to knowledge is the inclusion of multiple languages. [UNTERM](#) “is a multilingual terminology database maintained jointly by the main duty stations and regional commissions of the United Nations system” that could help initiate the extension of the taxonomy to include multiple languages (which can be incorporated as Alternative Labels). Ultimately, collaboration and consultation with subject matter experts working in different languages will be needed to ensure the accuracy and legitimacy of the taxonomy.

Taking this work forward

The PLACARD project has set the stage for this work and supported the development of the Connectivity Hub, which demonstrates how subject-specific taxonomies for general use, such as those developed here, can enable relevant content to be connected across silos: across different websites and platforms, and across different but overlapping communities of research, policy and practice.

We plan to take this work forward in collaboration with our existing partners, Martin Kaltenböck (Semantic Web Company - leading semantic technology experts and developers of PoolParty Semantic Suite), and Denise Recheis (Renewable Energy and Energy Efficiency Partnership, REEEP - developers of Climate Tagger and Secretariat of the community of practice, the Climate Knowledge Brokers).

The work of creating a global Climate Action Knowledge Graph will itself foster an already emerging alliance of global, regional and national knowledge brokers and domain experts specializing in climate and development information, and representing diverse organizations.

The building, promoting and maintaining of a Climate Action Knowledge Graph provides a shared purpose for a diverse set of information players – from governments to international organizations to research institutes, NGOs, industries and good practice networks.

Our concept note for the continuation of this work and the development of a Climate Action Knowledge Graph can be found here:

https://www.poolparty.biz/wp-content/uploads/2020/07/Climate-Change-Positioning-Paper_SWC_REEEP_SEI.pdf

A webinar explaining why a Climate Action Knowledge Graph is needed and how this technology works can be found here:

https://www.poolparty.biz/webinar-climate-change-action-through-artificial-intelligence-thank-you?utm_source=hs_email&utm_medium=email&utm_content=2&_hsenc=p2ANqtz-992fd72qdJRVaKOCla7pSjlb5eA9GFCZ6evoYhKMCKFTp2LoS3sAlb0MS4GRj3ARA6J03M_22n_pOBvtldMnpTZ7u_9Oa1PAfi94AjAin7DJE0sSU

Download the PLACARD CCA & DRR taxonomies:

https://www.researchgate.net/publication/342923425_PLACARD_taxonomies_CCA_DRR