

# Creating Synergies Across Global Assessments: The possibility of harmonized glossaries

## Overview and context

Many UN-led global assessments are produced each year. With the launch of each of these publications, they are typically supported with a glossary to enhance the exchange of information and facilitate communication with its readers. Glossaries are essential to establish authoritative definitions, eliminate uncertainty, and define new concepts within assessment processes and across publications. Additionally, when publications are translated, glossaries can be critical as they remove the ambiguity of terms used for the translations. Updating and maintaining these glossaries is essential for the major UN-led assessment publications.

Production, updating and maintenance of these glossaries requires coordination, research and sharing of existing linguistic resources, and the development new terms and definitions as they are conceived. Historically, the manual process for producing and maintaining glossaries has been cumbersome, error-prone, and laborious. the development of such crucial lists of definitions could benefit from thorough review and accurate automated assistance to improve efficiency and effectiveness to meet tight the time frames of the document production stage. This paper investigates the history of glossary creation and reviews the new systematic approach and implementation for the development of glossaries for Global Environment Outlook (GEO) products. This detailed semi-automated process could be adopted by similar assessments participating in the Adhoc Global Assessments Dialogue (AGAD) to help create synergies and improve efficiencies for the respective agency's glossaries. In addition to the adoption of this process, the different assessments in the Dialogue which often hold interlinking glossary terms, can share and distribute key and authoritative terms and definitions with each other.

## Background and History of the GEO glossaries process

The glossaries of the GEO publications were initially developed during the production of GEO 2000. Until recently, GEO had traditionally updated its glossaries through manual efforts with heavy quality control processes and readthroughs, and without a peer review process for these glossaries. The history of how or when terms and definitions were developed was not tracked and key definitions are now nearly untraceable. This has resulted in the duplication of efforts during the production of each publication's glossary.

Without a systematic approach, the creation of glossaries and authoritative definitions become costly, repetitive, and tedious. In 2020, a new system was developed by the GEO team to better track glossary terms and definitions, shift to a semi-automatic creation process, and include a peer review process. This new approach involved the development of a new 'Wiki Glossary Bank', an automated and accurate macro

tool to select terms and definitions, followed by peer and author review of the glossaries. This new system has become the foundation for how glossaries are developed for the GEO products and allows for the use of the Glossary Bank by other colleagues within and outside the agency. These new tools and processes allow GEO to collaborate with other assessments through the AGAD to promote synergies that allow assessment processes to combine efforts and generate benefits and time savings for all.

## Implications

### The Needs for a Glossary

Glossaries are essential for uniformity and consistent use of terminology in written communication. “Specifications cannot be written uniformly and unambiguously, and methods cannot be described succinctly without an agreed terminology” [1]. They provide readers with the foundation to understand the vocabulary, that may otherwise be incomprehensible. If a publication does have a glossary, this will lead to increasingly growing problems in publications. Such problems could include:

- An audience can be uninformed or uncertain about key concepts and methods, harming readers’ flow and creating misunderstandings in the narrative or even the intent of the publication. A reader’s uncertainty can also lead to avoidance of certain publication sections which may be critical for their comprehension of the report’s full message.
- Misuse of controversial or politically sensitive terms. If an authoritative definition is not established for a controversial or political term, this can cause misunderstandings in the reader’s perception of the text leading to potentially sensitive situations.
- Without a glossary, translations of the publication can become inaccurate and terms can be taken out of context. Incorrect translation of certain phrases can damage the entire report’s credibility and communication. In translations, the relationship between concepts and their designations are always of concern.

All of these situations can lead to reputational damage for the publishing entity and also to misunderstandings of the key scientific findings, potentially harming key policy processes.

### The Needs for an Adequate, Consistent Process

While the implications for the lack of glossaries or poorly constructed glossaries are clear, the question of how to establish an authoritative and accurate glossary becomes imperative. In the past, UNEP’s Global Assessments Unit used copyeditors to develop and tailor glossaries for key publications. This resulted in an undocumented and inconsistent process of glossary creation while coming at a significant cost to the organization. Subsequent GEO glossaries were often copied from preceding publications with few additions or improvements made. Therefore, the Global Assessments Unit required a new well documented and consistent process to resolve this issue.

In 2020, a new Wiki Glossary Bank was developed, which allowed the implementation of an automated glossary generation tool, and a glossary peer review process. With the creation of this new process, many

underlying issues were resolved, allowing for efficient and effective glossary creation. The solutions included:

- No longer working with outdated material with a poor understanding of its history. Previous glossaries had relied on external partners who did not provide a clear explanation of the process of how the glossaries were being developed. This has caused problems in subsequent GEO glossaries including:
  - Unknown sources for individual definitions, resulting in duplication of research and verification.
  - Outdated definitions and sources, resulting in additional internal review within short timeframes.
- No longer fostering an inconsistent, unclear and manual process. GEO glossaries were previously manually reviewed to determine which terms existed from previous glossaries. The copyeditor, who might be different for each assessment, would confirm if the definitions were adequate. This allowed room for error and did not allow much time for development of new terms or definitions. Such unclear processes can cause confusion and delay document production stages which tend to hold tight timelines. The new process resolves these issues by automating accurate glossary generation and includes a peer and author review process to update existing terms and definitions as well as the creation of new ones.
- Reducing the cost of glossary creation. The previous approach of using external copy editors for glossary generation was costly in terms of time and money. The new process is managed internally and uses existing resources such as GEO team members and the report authors to develop glossaries.
- Improving the report translation process. If terms and their definitions are not maintained, translation of terms can become inaccurate. The new review process ensures that the definitions match the narrative and context of the report. This prevents terms from being translated into the incorrect variants or synonyms.

The new approach significantly reduces the effort required for glossary creation and provides room for collaboration and synergies with other assessments.

### [Wiki Glossary Bank](#)

The concept of the Glossary Bank is to offer a one-stop location for searching and producing glossary terms needed for current and future publications. The Bank is built to allow harmonization of glossaries across assessments, support other UNEP reports in their own glossary development and also enable the tracking of changes and additions to glossary terms and definitions.

The Wiki Bank currently holds over 1100 terms, definitions, and sources. The Bank allows for the creation and customization of multiple definitions and literature sources for each of its terms. This has proven useful for terms that are tailored to different narratives in different reports. Additionally, all changes made

to the Wiki Bank are tracked and recorded within a Wiki log. This helps track the expansion and adjustment of the Glossary Bank over time.

Terms and their authoritative definitions are consistently added from newer publications' glossaries as they are released. These include glossaries from other relevant reports such as those of [IPCC](#), [IPBES](#), [ILO](#), [FAO](#), [WHO](#) and [UN Habitat](#). Lastly, as GEO products are being developed, new terms are often discovered and are combined with the existing Bank.

### New definitions and their creation

The use of new terms and definitions is necessary as innovations, new findings and concepts are developed in the environmental sphere. To keep up with these changes, new terms and concepts are tracked and added from relevant reports. This requires periodic research into these definitions to maintain the glossary's relevance. Research on these terms and definitions is mostly performed by report readthroughs, for example, IPCC's most recent sixth assessment report on climate change. Other research delves into official global dictionaries if the term and definition is applicable to the report. Once new terms and definitions are identified either by the Secretariat or the authors, an authoritative definition, with its source, is provided and added to the Wiki Glossary Bank.

### Implementation

“Manually constructing glossaries requires the cooperative effort of a team of domain experts and involves several steps, including identifying consistent domain terminology, producing textual definitions of terms, and harmonizing the results. This procedure is time-consuming and costly...” [2].

The new Glossary Bank also includes an automated and flexible tool involving a Virtual Basic for Applications (VBA) macro that analyzes the text of any given report and matches all existing Wiki Glossary Bank terms to automatically generate those terms in the report glossary. Definitions are then applied to the list of terms generated.

Second, a review process of the glossary provided by the Secretariat is conducted by the authors of the assessment to ensure the quality and accuracy of the definitions, to detect any missing terms from the assessment, and to adjust definitions that would fit better for any given the report. This is essential for when new terms exist in the report but not in the Wiki Glossary Bank. This is where both the Secretariat and the authors can build new terms and definitions for the Wiki Bank.

Lastly, the glossary is reviewed by the Secretariat with a final readthrough for its approval and formatting. Once agreed, the glossary is resent to the authors for any final comments if necessary.

These three phases are defined thoroughly in the timeline below.

## Collaboration

To further collaborate and enhance synergies across the assessment processes participating in the AGAD, the GEO team would like to demonstrate this efficient and accurate system in other assessment contexts to learn from, adopt, and, in the future, possibly contribute to these processes. Having this collaborative process available across assessments benefits all parties involved by sharing widely the Wiki Glossary Bank terms and definitions leading to improvements and additions to the Bank.

Promoting greater coherence and coordination of glossaries across global assessments will help improve the timeliness, relevance, legitimacy, accuracy and credibility of these assessments. The GEO Glossary Bank can improve and advance the understanding of terms across all assessments.

## References

[1] P.G. Holland, "The importance of glossaries," 2002

<https://www.sciencedirect.com/science/article/pii/S0955598602000584?via%3Dihub>

[2] E.P. Bontas and M. Mochol, "Towards a Cost Estimation Model for Ontologies," Proc. 3rd Berliner XML Tage, HumboldtUniversität zu Berlin and Freie Univ. Berlin, 2005, pp. 153–160.

## Annex 1 Wiki Glossary Bank

This is a front-page example of the Wiki Glossary. Here, over 1500 terms, definitions and sources are stored here. This is the collaborating space that other assessments will contribute to. As new terms are developed, they are added to this list. All terms here are later added into the automated glossary macro tool.

If you would like to create your own glossary for a publication, you may use this [macro](#) to do so. This will allow you to search for all existing terms in your publication and generate them towards the end of document. To better understand how to use this macro, please follow this [guide by Steve Yobles](#) on how to do so.

Word, Definition	Link
<b>Abundance</b> The number of individuals or related measure of quantity (such as biomass) in a population, community or spatial unit.	ENVIS Centre on Human Ecology <a href="https://pbehedenvs.nic.in/glossary/a.html">https://pbehedenvs.nic.in/glossary/a.html</a>
<b>Abundance (ecological)</b> The size of a population of a particular life form in a given area.	IPBES Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
<b>Abrupt change</b> The change that takes place so rapidly and unexpectedly that human or natural systems have difficulty adapting to it.	National Academic Press <a href="https://www.nap.edu/read/10136/chapter/3">https://www.nap.edu/read/10136/chapter/3</a>
<b>Acceptance</b> Acceptance of the Platform's outputs at a session of the Plenary signifies that the material has not been subjected to line-by-line discussion and agreement, but nevertheless presents a comprehensive and balanced view of the subject matter.	IPBES <a href="https://ipbes.net/glossary">https://ipbes.net/glossary</a>
<b>Acidification</b> Change in natural chemical balance caused by an increase in the concentration of acidic elements.	Dictionary University <a href="https://dictionary.university.ac.id/acidification">https://dictionary.university.ac.id/acidification</a>
<b>Acidity</b> A measure of how acid a solution may be. A solution with a pH of less than 7.0 is considered acidic.	United States Environmental Protection Agency (EPA) <a href="https://pub.epa.gov/oslp/eublr_research_report.cfm?tab=CEMM&amp;acidfityid=147671#...text=Description%3Awell%20ac%20chemical%20action%20rates">https://pub.epa.gov/oslp/eublr_research_report.cfm?tab=CEMM&amp;acidfityid=147671#...text=Description%3Awell%20ac%20chemical%20action%20rates</a>
<b>Adaptation</b> Adjustment in natural or human systems to a new or changing environment, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation. In human systems, the process of adjustment to actual or expected climate and its effects in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate (AGR).	Adaptation Gap Report (AGR) <a href="https://www.unenvironment.org/resources/adaptation-gap-report">https://www.unenvironment.org/resources/adaptation-gap-report</a>
<b>Adaptive capacity</b> The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.	United Nations Framework Convention on Climate Change (UNFCCC) <a href="https://www4.unfccc.int/sites/NAPC/Pages/glossary.aspx">https://www4.unfccc.int/sites/NAPC/Pages/glossary.aspx</a>
<b>Adaptive governance</b> A governance approach that incorporates methods of adaptive management, adaptive policy making and transition management for addressing complex, uncertain and dynamic issues. Adaptive governance relies on polycentric institutional arrangements for decision making at multiple scales. Spanning the local and global levels, this form of governance provides for collaborative, flexible, learning-based approaches to ecosystem management.	Global Environment Outlook 6 (GEO 6) <a href="https://wedocs.unep.org/bitstream/handle/20.500.11822/27682/GEO6_back.pdf?sequence=1&amp;isAllowed=y">https://wedocs.unep.org/bitstream/handle/20.500.11822/27682/GEO6_back.pdf?sequence=1&amp;isAllowed=y</a>
<b>Aeolian</b> Pertaining to wind activity, especially in relation to wind erosion.	Sand and Dust Storms Report <a href="https://uneplive.unep.org/redesign/media/docs/assessments/global_assessment_of_sand_and_dust_storms.pdf">https://uneplive.unep.org/redesign/media/docs/assessments/global_assessment_of_sand_and_dust_storms.pdf</a>
<b>Aeroponics</b> A plant cultivation technique in which the roots hang suspended in the air while nutrient solution is delivered to them in the form of a fine mist climate geoeengineering	Global Environment Outlook 6 (GEO 6) <a href="https://wedocs.unep.org/bitstream/handle/20.500.11822/27682/GEO6_back.pdf?sequence=1&amp;isAllowed=y">https://wedocs.unep.org/bitstream/handle/20.500.11822/27682/GEO6_back.pdf?sequence=1&amp;isAllowed=y</a>
<b>Aerosol</b> A collection of airborne solid or liquid particles, with a typical size between 0.01 and 10 micrometres (µm), that resides in the atmosphere for at least several hours. Aerosols may be of either natural or anthropogenic origin.	Sand and Dust Storms Report <a href="https://uneplive.unep.org/redesign/media/docs/assessments/global_assessment_of_sand_and_dust_storms.pdf">https://uneplive.unep.org/redesign/media/docs/assessments/global_assessment_of_sand_and_dust_storms.pdf</a>
<b>Aerosol Index</b> An indicator that detects the presence of uv absorbing aerosols such as dust and soot.	Sand and Dust Storms Report <a href="https://uneplive.unep.org/redesign/media/docs/assessments/global_assessment_of_sand_and_dust_storms.pdf">https://uneplive.unep.org/redesign/media/docs/assessments/global_assessment_of_sand_and_dust_storms.pdf</a>
<b>Aerosol Optical Depth</b> A measure of radiation extinction due to the interaction of radiation with aerosol particles in the atmosphere, primarily due to the processes of scattering and absorption. Also referred to as aerosol optical thickness.	Sand and Dust Storms Report <a href="https://uneplive.unep.org/redesign/media/docs/assessments/global_assessment_of_sand_and_dust_storms.pdf">https://uneplive.unep.org/redesign/media/docs/assessments/global_assessment_of_sand_and_dust_storms.pdf</a>
<b>Aerosol transmission</b> One of two airborne means of infectious disease spreading. In aerosol form, viral particles are suspended in the air by physical and chemical forces for hours or more. In droplet form, in contrast, viral particles remain airborne for a few seconds after someone sneezes or coughs and are able to travel only a short distance before gravitational forces pull them down.	Stat News <a href="https://www.statnews.com/2020/09/16/coronavirus-can-become-aerosol-doesnt-mean-doomed/">https://www.statnews.com/2020/09/16/coronavirus-can-become-aerosol-doesnt-mean-doomed/</a>
<b>Afforestation</b> Establishment of forest plantations on land that is not classified as forest.	Food and Agriculture Organization of the United Nations (FAO) <a href="http://www.fao.org/3/a/i347e/a/i347e02.htm">http://www.fao.org/3/a/i347e/a/i347e02.htm</a>
<b>Aflatoxin</b> Aflatoxins are poisonous substances produced by certain kinds of fungi (moulds) that are found naturally all over the world; they can contaminate food crops and pose a serious health threat to humans and livestock. Aflatoxins also pose a significant economic burden, causing an estimated 25% or more of the world's food crops to be destroyed annually.	World Health Organization (WHO) <a href="https://www.who.int/foodsafety/FSDigest_Aflatoxins_EN.pdf">https://www.who.int/foodsafety/FSDigest_Aflatoxins_EN.pdf</a>
<b>African trypanosomiasis</b> (also spelled 'trypanosomiasis'): A disease of livestock (African animal trypanosomiasis) and humans ('sleeping sickness'). These diseases are caused by single-celled trypanosome parasites ( <i>Trypanosoma brucei gambiense</i> and <i>Trypanosoma brucei brucei</i> ) that are transmitted to their animal and human	United States Centre for Disease Control (USCDC)

## Annex 2 Automated Glossary Tool VBA Code

This is an example of the coding script used to accurately identify all terms found in an assessment. It automatically generates all terms found in the Wiki glossary into its code to later identify and generate a glossary list towards the end of an assessment.

```
Sub HighlightList1()
Application.ScreenUpdating = False
Dim StrFnd As String, Rng As Range, i As Long
StrFnd = "Ablation zone, Abrupt change, Absorption, Abundance, Acclimatization, Acidification, Acidity, Adaptation, Adaptive capacity, Adaptive governance, Adsorption, Advanced gap, Aeolian , Aerated soil, Aeroionics, Aerosol, Aerosol index, Aerosol optical depth, Aerosol transmission, Affirmative action, Afforest"
For i = 0 To UBound(Split(StrFnd, ","))
    Set Rng = ActiveDocument.Range
    With Rng.Find
        .ClearFormatting
        .Text = Split(StrFnd, ",")(i)
        .Replacement.ClearFormatting
        .Replacement.Highlight = True
        .Replacement.Text = "&"
        .Forward = True
        .Wrap = wdFindContinue
        .Format = True
        .MatchCase = False
        .MatchWholeWord = True
        .MatchWildcards = False
        .MatchSoundslike = False
        .Execute Replace:=wdReplaceOne
    End With
Next
Set Rng = Nothing
Application.ScreenUpdating = True
End Sub

Sub HighlightList2()
Application.ScreenUpdating = False
Dim StrFnd As String, Rng As Range, i As Long
StrFnd = "Arctic horizon, Arranged marriage, Artefacts, Arthropod, Ash content, Aspergillosis, Asymptomatic carriers, Asymptote, Available soil moisture, Available water capacity, Average precipitation, Avian influenza, Azoic sediment, B horizon, Background sample, Bacterial antagonism, Bacterial competition, Bacter"
For i = 0 To UBound(Split(StrFnd, ","))
    Set Rng = ActiveDocument.Range
    With Rng.Find
        .ClearFormatting
        .Text = Split(StrFnd, ",")(i)
        .Replacement.ClearFormatting
        .Replacement.Highlight = True
        .Replacement.Text = "&"
        .Forward = True
        .Wrap = wdFindContinue
        .Format = True
        .MatchCase = False
        .MatchWholeWord = True
        .MatchWildcards = False
        .MatchSoundslike = False
        .Execute Replace:=wdReplaceOne
    End With
Next
Set Rng = Nothing
Application.ScreenUpdating = True
End Sub

Sub HighlightList3()
Application.ScreenUpdating = False
Dim StrFnd As String, Rng As Range, i As Long
StrFnd = "Biosphere reserve, Biostimulation, Biota, Biotechnology, Biotic, Bioturbation, site of infected sandflies. there are three main forms, Black carbon, Bleaching (of coral reefs), Blend wall, Blowing dust, Blue economy, Blue water, Bottom-up, Bovine spongiform encephalopathy (BSE), Bovine tuberculosis, Break"
For i = 0 To UBound(Split(StrFnd, ","))
    Set Rng = ActiveDocument.Range
    With Rng.Find
        .ClearFormatting
        .Text = Split(StrFnd, ",")(i)
        .Replacement.ClearFormatting
        .Replacement.Highlight = True
        .Replacement.Text = "&"
        .Forward = True
        .Wrap = wdFindContinue
        .Format = True
    End With
Next
Set Rng = Nothing
Application.ScreenUpdating = True
End Sub
```