IPBES TCA Chapter 3. Systematic review of literature on transformative change for sustainability / IPBES transformative change assessment

Project leaders
Catherine Sabinot (catherine.sabinot@ird.fr), Rainer Kruger (Rainer.Krug@senckenberg.de).

Researchers
David Lam (david.lam@leuphana.de), Andressa Mansur (andressavmansur@gmail.com), Maiko Nishi (nishi@unu.edu), Zühre Aksoy (zuhre.aksoy@boun.edu.tr).

Data curator(s)
Camille Guibal (camille.guibal@umontpellier.fr)

Description
The review corresponds to the IPBES transformative change assessment. The IPBES scoping document for the transformative change assessment describes that chapter 3 should address how transformative change occurs, focusing on those changes that can be intentionally promoted, accelerated, and scaled to realize a sustainable world where biodiversity can thrive. The chapter provides evidence on theories and frameworks for understanding deliberate, or emergent transformative change. In this context, a review of knowledge focused on building clusters of theories and frameworks of transformative change based on literature on transformative change for sustainability was conducted and is further described below.

Process overview

Chapter expert identification of review
articles

N=6

Screening
most
important
references

OpenAlex snowball search results

N=1695

End point
Evidence presented
in Chapter 3
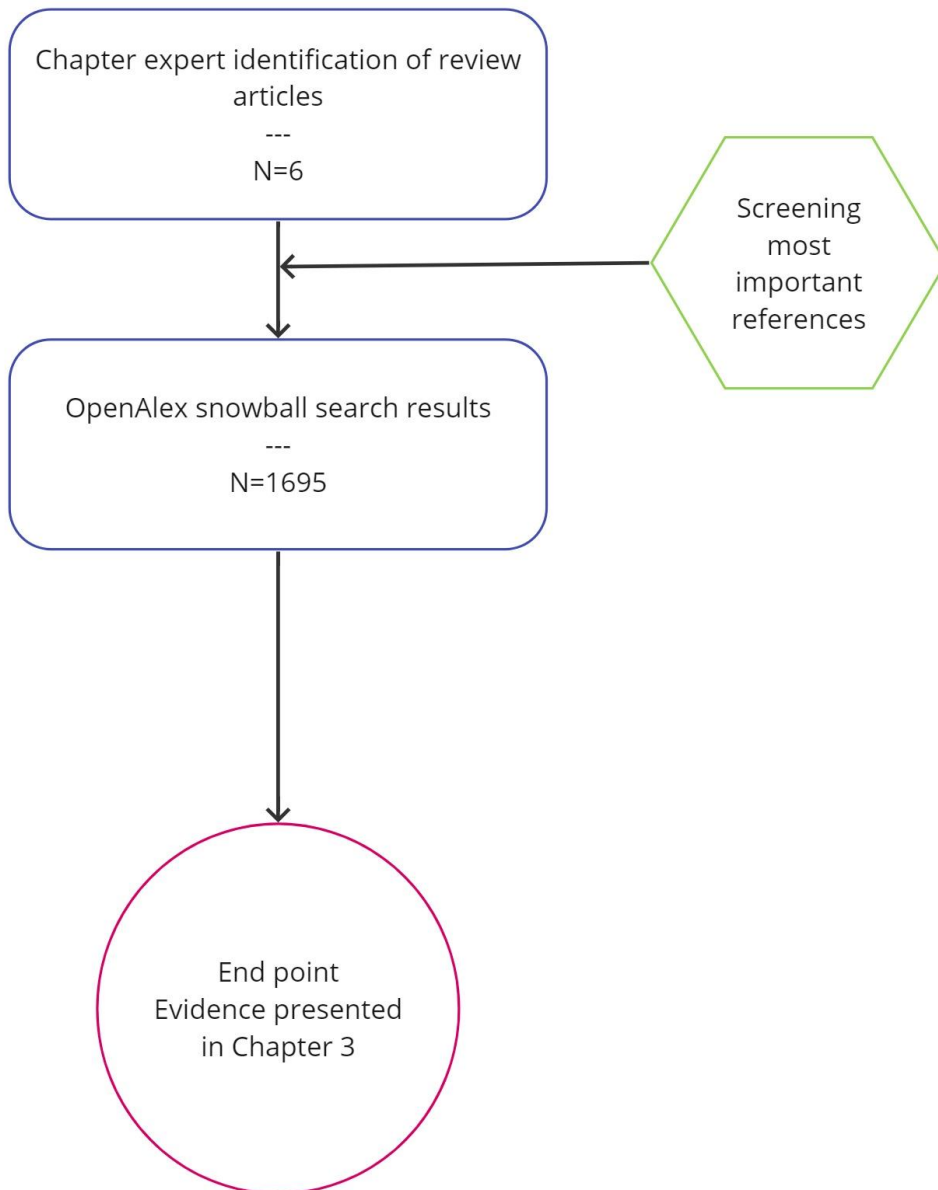
Protocol

Process 1: Identification of relevant articles based on expert knowledge

With the help of the IPBES data technical support unit, a thorough review based on recent review articles has been conducted. All experts in Chapter 3 were asked to name the most important and comprehensive recent literature reviews on transformative change for sustainability. Six review articles were identified, comprising between 83 and 115 references each:

- T. Evans et al., 2023
- Fisher et al., 2022
- Loorbach et al., 2017
- Scoones et al., 2020
- Feola et al. 2015
- Patterson et al., 2017

Process 2: Systematic review based on snowball search

This method allowed the strengthening the classification of clusters of theories and frameworks of transformative change, and its results are included in sections 3.2 and 3.3

- **Type of analysis/search/review:** systematic review based on the 357 different references cited in the 6 review articles by conducting a snowball search
- **Search languages:** English
- **Search engine:** OpenAlex
- **Sample extracted:** 1695 publications[1]
- **Treatment applied:** First, citations were identified by doing a snowball search going one generation backwards and forward for each of them (Fig. 1). In addition, two measures were calculated:

1) the "local frequency" e.g. the number of times that the reference is used within the text of the article was calculated for each of the six selected articles;

2) a citation index called "average yearly citation (AYC)" which equals the number of citations overall of each article divided by the number of years the article has been published

This resulted in a new spreadsheet including a list of 1695 publications citing these references, together with publication years, journal titles, locations of the authors, and abstracts, which enabled to evaluate the quality of the impact of each paper, the importance of the paper for the assessment, the knowledge gaps and the main drivers of these gaps when/if relevant. In addition, papers which are linked to at least two of the 6 review articles (excluding the non-published ones) have been identified and considered as important papers.

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[1] https://ipbes-data.github.io/IPBES_TCA_Ch3_snowball-search/IPBES_BBA_Ch3_snowball_DMP.html
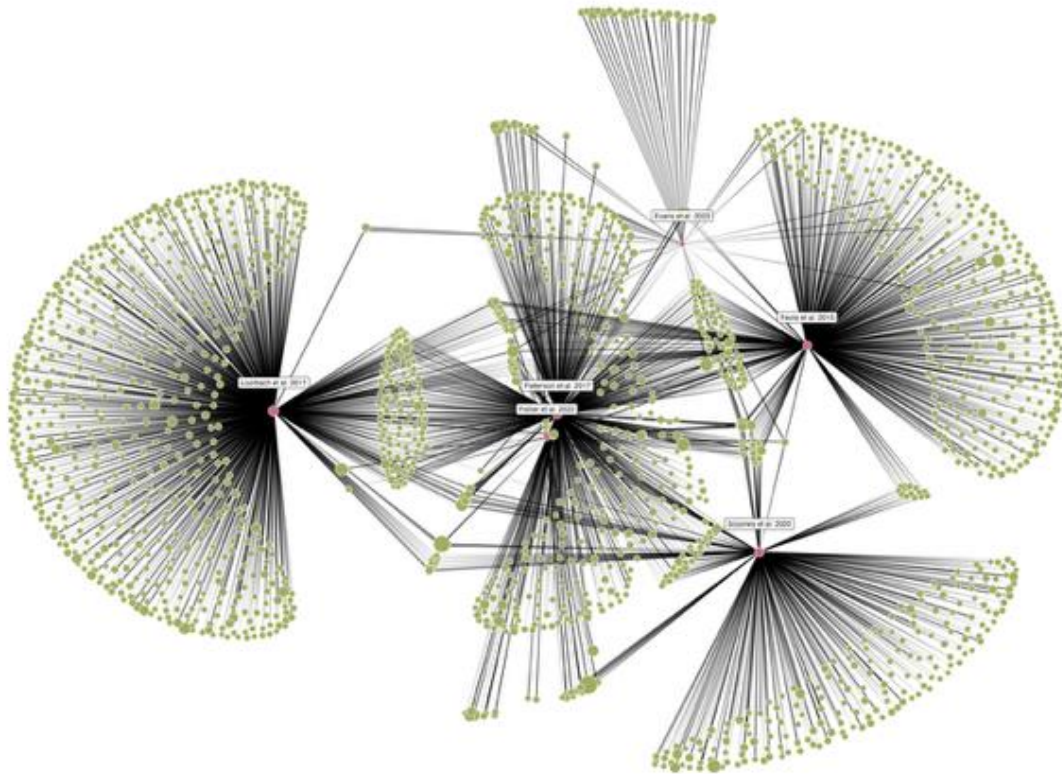
Figure 1. Figure showing snowball search (forward - backward search) conducted on the six published papers used in our third phase review approach. The red dots are the key-papers identified, the other papers cited or citing these. The lines start from grey to black, e.g. the "grey side" is citing the "black" side. The size of the circles indicates the number of times that the paper has been cited. Note that the edges are only one step forward and backward - so cross citations of the outer points are not included. This figure shows the citation network of the 1665 papers resulting from the snowball search. The network only contains the citations from and to the key papers and does not include all citations between the other papers in the interest of readability of the figure, although they are available for the analysis.
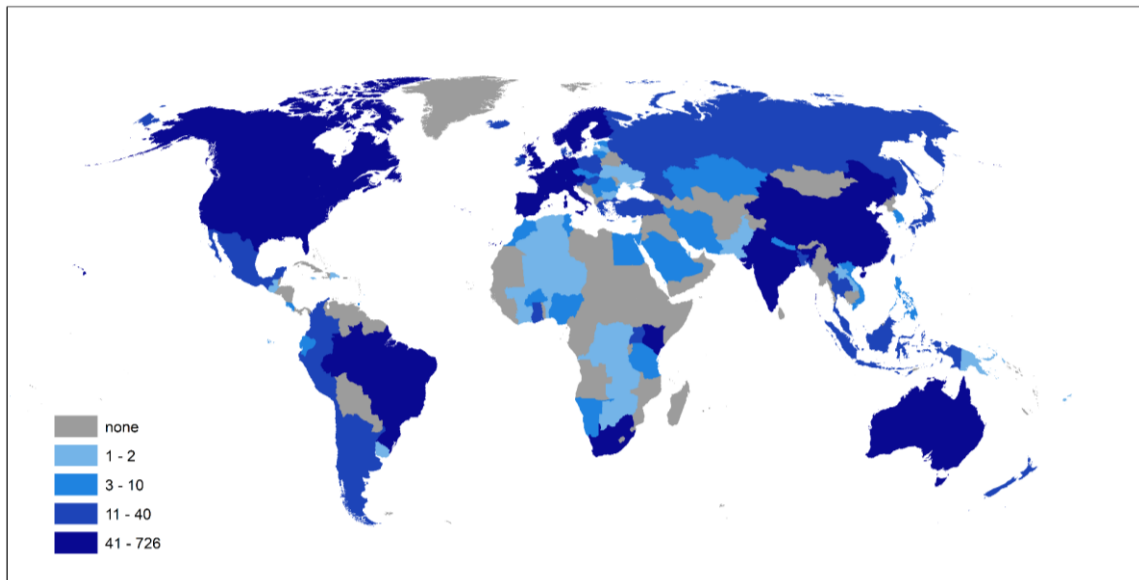
Figure 2. Heat Map showing the geographical producers of Scientific Publications related to the snowball search (forward - backward search) conducted on the six published papers used in our third phase review approach. The map shows the distribution of all authors of the 1697 publications weighted by their frequency and indeed shows the places that do not produce any literature on the subject or that are under the radar of the recent review papers.

This figure spatializes the scientific production and identifies the hot and cold spots in scientific production in relation to the literature reviews identified as important by the assessment's experts. For a more in-depth exploration in the publications identified, each of them has been tagged with multiple concepts, based on the title, abstract, and the title.