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CESAB
CENTRE DE SYNTHÈSE ET D'ANALYSE SUR LA BIODIVERSITÉ

The importance of a Protocol: an under-recognised element of systematic reviews and meta-analysis

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Why is it important to develop a Protocol?

"Accurate, unbiased and concise synthesis of available evidence following clear methodology and transparent reporting is necessary to support effective environmental policy and management decisions" (Pullin *et al.* 2022)

Pullin *et al. Environmental Evidence* (2022) 11:16
https://doi.org/10.1186/s13750-022-00269-9

Environmental Evidence

COMMENTARY Open Access

Check for updates

Standards of conduct and reporting in evidence syntheses that could inform environmental policy and management decisions

Andrew S. Pullin[1,11*], Samantha H. Cheng[2], Josephine D'Urban Jackson[3], Jacqualyn Eales[4], Ida Envall[5], Salamatu J. Fada[6,7], Geoff K. Frampton[8], Meagan Harper[9], Andrew N. Kadykalo[9], Christian Kohl[10], Ko Konno[11], Barbara Livoreil[12], Dakis-Yaoba Ouédraogo[13], Bethan C. O'Leary[14,15], George Pullin[16], Nicola Randall[17], Rebecca Rees[18], Adrienne Smith[19], Romain Sordello[20], Eleanor J. Sterling[21], Will M. Twardek[22] and Paul Woodcock[23]

Why is it important to develop a Protocol?

Traditional approaches to reviewing literature may be susceptible to bias and result in incorrect decisions (Haddaway *et al.* 2020).

Despite the increasing popularity of systematic reviews in the environmental field, evidence synthesis methods continue to be poorly applied in practice (Haddaway *et al.* 2020).


PERSPECTIVE
https://doi.org/10.1038/s41559-020-01295-x
nature ecology & evolution
Check for updates

Eight problems with literature reviews and how to fix them

Neal R. Haddaway[1,2,3], Alison Bethel[4], Lynn V. Dicks[5,6], Julia Koricheva[7], Biljana Macura[2], Gillian Petrokofsky[8], Andrew S. Pullin[9], Sini Savilaakso[10,11] and Gavin B. Stewart[12]

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Scientific principles should be followed:

A protocol aims at objectifying the results/conclusions:

- Replicability
- Transparency, archiving
- Consideration of biases (internal, external), Reliability

✔ provides a framework to achieve
✔ outlines a systematic approach

Maximizing reliability = published protocol + review (both peer-reviewed)

Why is it important to develop a Protocol?

What does the CEE say?

- A review protocol provides a step-by-step guide for conducting Evidence reviews.
- Develop an *a priori* protocol before starting the literature review so that the process is **clear** and **consistent**.
- The protocol should contain specific guidelines to identify, screen relevant articles, extract data, and analyse the data.
- The protocol can help the review team replicate the work i.e. **update** the literature review when new research becomes available.

Guidelines and Standards for Evidence Synthesis in Environmental Management

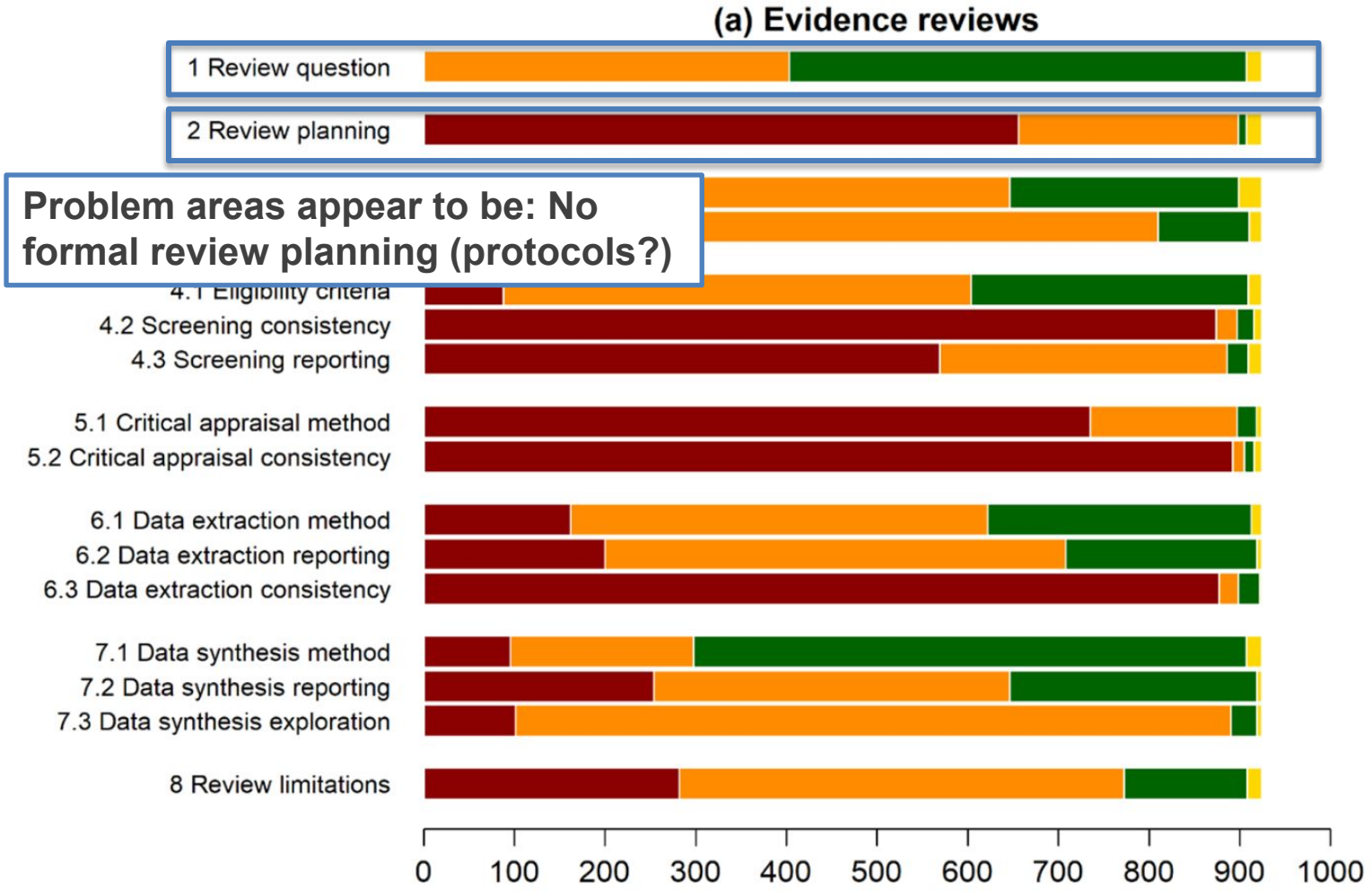
Collaboration for Environmental Evidence

Section 4

Writing and registering a Protocol

https://environmentalevidence.org/information-for-authors/4-writing-and-registering-a-protocol/

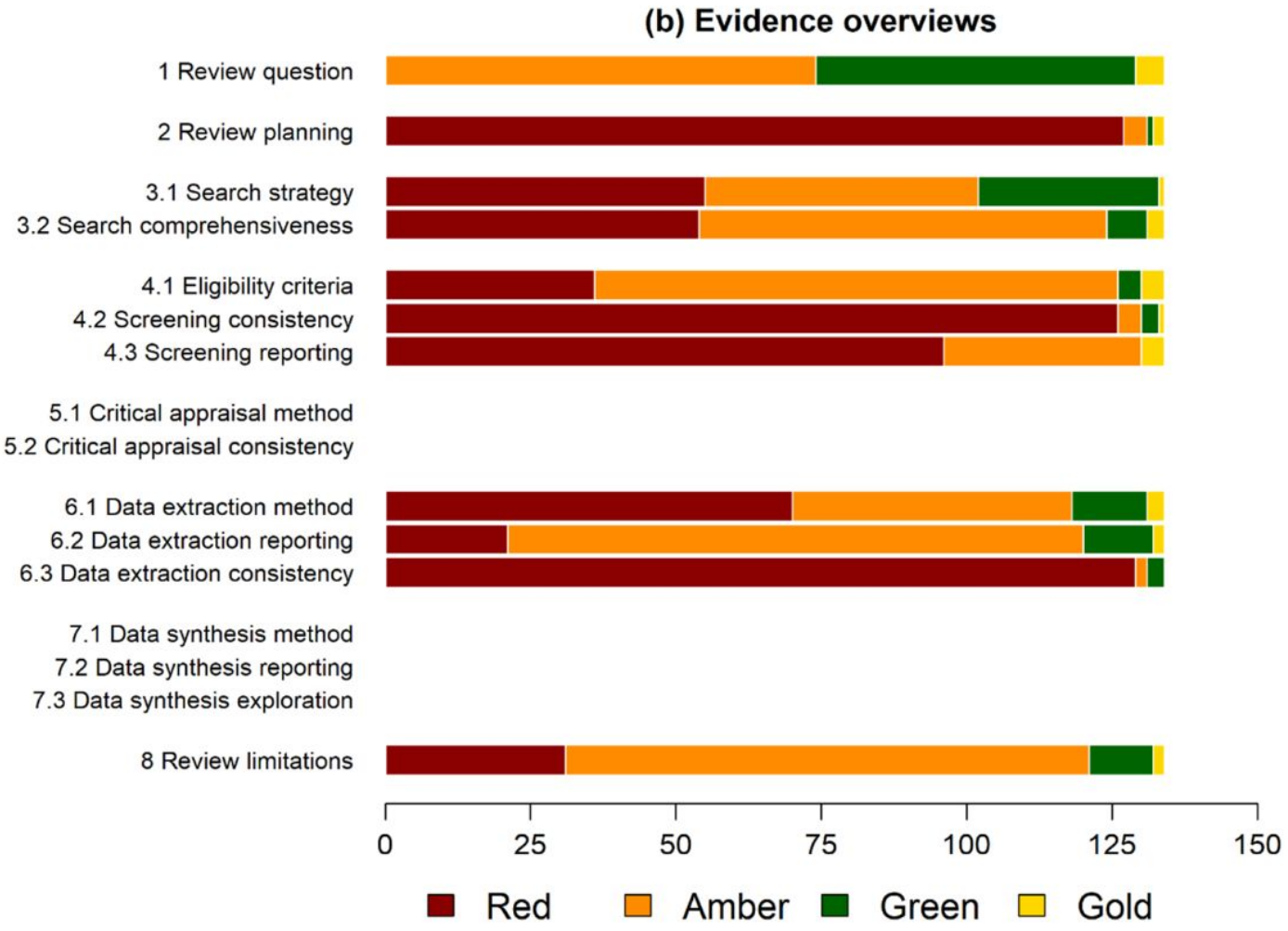
Reliability and replicability of evidence reviews



Problem areas appear to be: No formal review planning (protocols?)

(Pullin *et al.* 2022. *Environmental Evidence*. https://doi.org/10.1186/s13750-022-00269-9)

Reliability and replicability of evidence reviews



(Pullin *et al.* 2022. *Environmental Evidence*. https://doi.org/10.1186/s13750-022-00269-9)

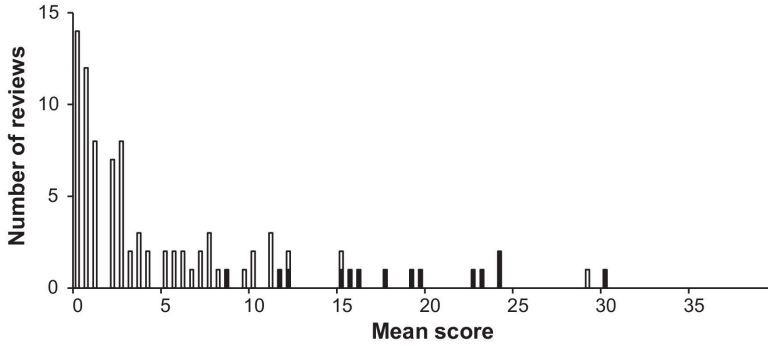
Reliability and replicability of evidence reviews

- 92 reviews evaluated using CEESAT
- Published between **January and March 2015** across **68 different peer-reviewed journals** and 3 grey literature sources;

Contents lists available at ScienceDirect
Environmental Science & Policy
journal homepage: www.elsevier.com/locate/envsci

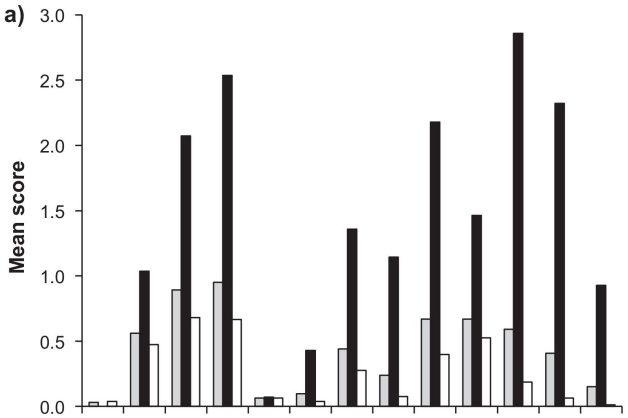
The reliability of evidence review methodology in environmental science and conservation

Bethan C. O'Leary[a,*], Kristian Kvist[a], Helen R. Bayliss[a], Géraldine Derroire[b], John R. Healey[b], Kathryn Hughes[c], Fritz Kleinschroth[b], Marija Sciberras[c], Paul Woodcock[d], Andrew S. Pullin[a]



Overall, the mean score was **5.8** but the median value was **2.5**

Reviews received a score of 3, 1 or 0 for each of the 13 criteria (maximum possible score 39)



Mean scores for all syntheses (grey), meta-analyses (black) and narrative syntheses (white) across CEESAT criteria

Problems without a protocol

Mission creep:

Occurs when the review deviates from the initial objectives

What elements can evolve during the process?

- *Key definitions*
- *Search strategies and inclusion*
- *Appraisal criteria may alter over time or differ between reviewers*

What are the consequences?

- **not representative** of the evidence base because **important studies may have been omitted**
- Inaccurate and misleading
- Unrepeatable, not upgradable, not updateable

Haddaway *et al*. 2020. Nature ecology and evolution. https://doi.org/10.1038/s41559-020-01295-x

Problems without a protocol

Lack of transparency/replicability:

An ability to repeat a review's methods exactly ('replicability')

If the reader can't understand:

- *how studies were identified, selected and synthesized*
- *which ones were excluded*,

What are the consequences?

Risk of bias cannot be assessed, and **unclear subjective decisions can be fully trusted.**

Haddaway *et al*. 2020. Nature ecology and evolution. https://doi.org/10.1038/s41559-020-01295-x

Help with planning

- Campbell Systematic Reviews: Policies and Guidelines (Campbell Collaboration, 2014). https://onlinelibrary.wiley.com/pb-assets/assets/18911803/Campbell%20Policies%20and%20Guidelines%20v4-1559660867160.pdf
- Higgins, J. P. et al. Cochrane Handbook for Systematic Reviews of Interventions (John Wiley & Sons, 2019). https://training.cochrane.org/handbook
- Shea, B. J. et al. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. BMJ 358, j4008 (2017). https://www.bmj.com/content/358/bmj.j4008
- Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) https://www.prisma-statement.org/
- RepOrting standards for Systematic Evidence Syntheses (ROSES) https://www.roses-reporting.com/

Guidelines and Standards for Evidence Synthesis in Environmental Management

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Section 3

Planning a CEE Evidence Synthesis

https://environmentalevidence.org/information-for-authors/3-planning-a-cee-evidence-synthesis/

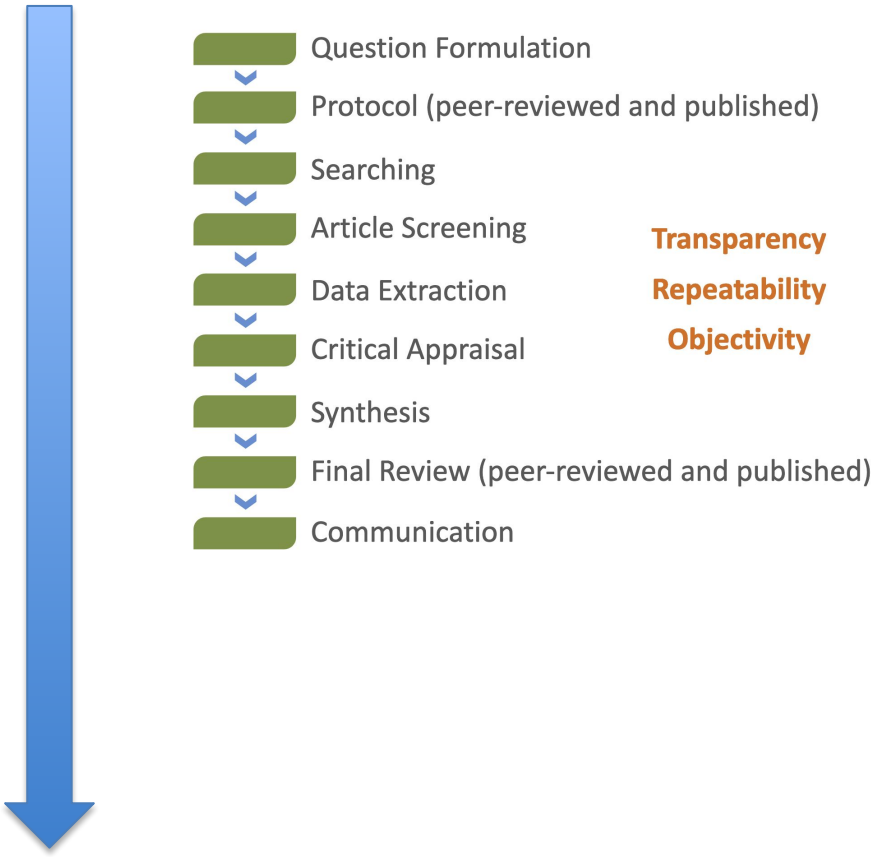
How to develop a review Protocol?

1. **Background/Purpose**

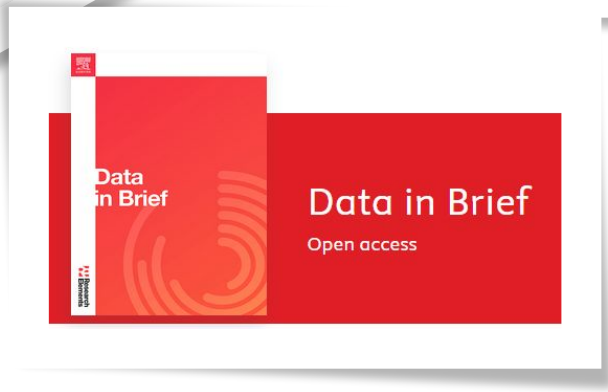
2. **Objectives/Review Question**

3. **Methods**
   - a. **Selection Criteria**
   - b. **Search Strategy**
   - c. **Data Collection**
   - d. **Displaying Data**
   - e. **Analysis and Synthesis**

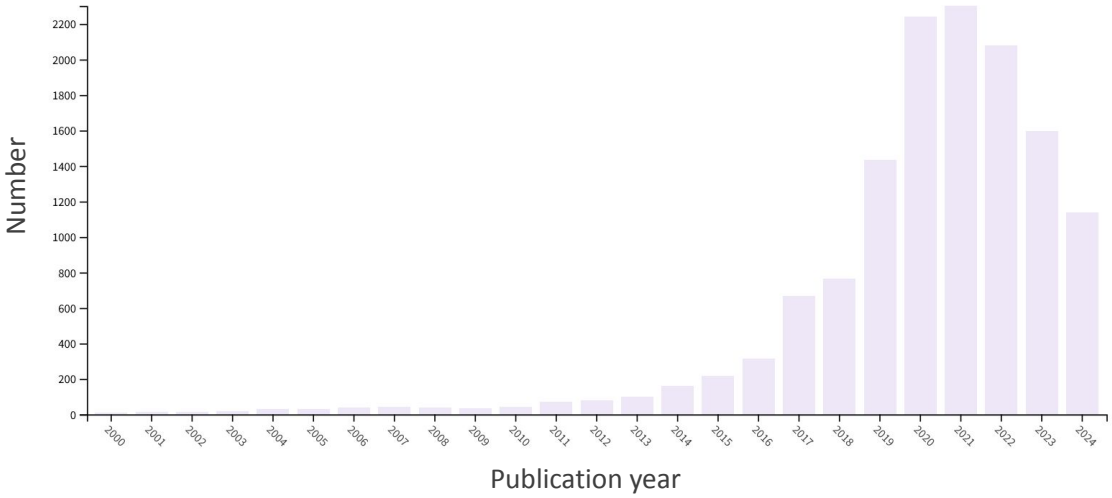
etc.



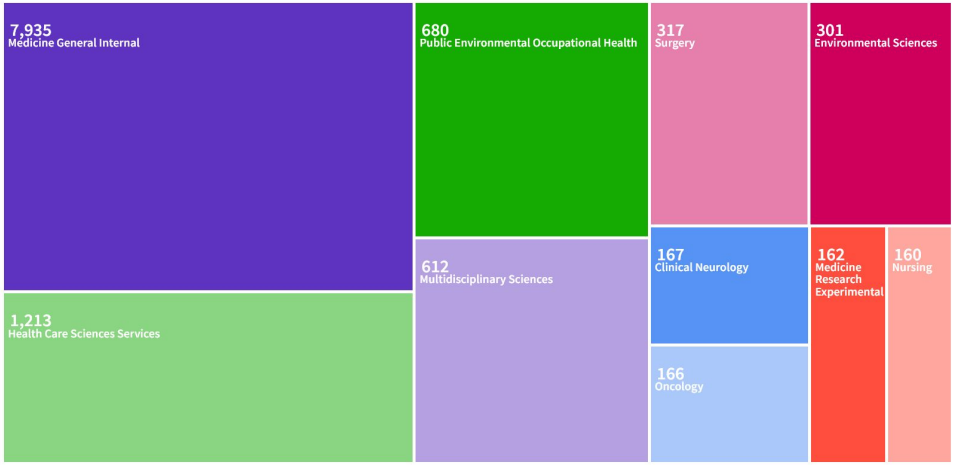
Where to publish?



Where to publish?



TI = ((review OR systematic OR meta-analysis) AND (protocol))



PROCEED – « fast track » your protocol

A global registration system for titles and protocols of environmental evidence reviews and syntheses

Collaboration for Environmental Evidence

JKI Julius Kühn-Institut

What is PROCEED?

PROCEED is a global database of prospectively registered evidence reviews and syntheses in the environmental sector. It provides an open access resource of titles and protocols of environmental evidence reviews/syntheses. Authors can register and upload their titles and protocols using appropriate templates. The database is open-access and free to all.

Go to PROCEED

https://www.proceedevidence.info/

PROCEED – « fast track » your protocol

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PROCEED
WWW.PROCEEDEVIDENCE.INFO

Systematic review

Systematic Review Protocol

Title
What is the influence on socio-economic well-being of UNESCO biosphere reserves in Southeast Asia? A systematic review protocol

Citation:
Phuong Thao Nguyen, Duong Minh Lam, Jacqualyn Eales. What is the influence on socio-econom well-being of UNESCO biosphere reserves in Southeast Asia? A systematic review protocol: a Systematic Review Protocol. PROCEED-22-00029 Available from:
https://www.proceedevidence.info/protocol/view-result?id=29
https://doi.org/10.57808/proceed.2022.5

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j.f.eales@exeter.ac.uk

Keywords
UNESCO biosphere reserves, conservation, Southeast Asia, human well-being, socio-economics

Background
This PROCEED submission follows the open access a-priori availability of the protocol at Zenodo prior to commencing this review, on 27th October 2020. DOI: 10.5281/zenodo.4136658 The conc of Biosphere Reserves was introduced in 1975 (Jaisankar, Velmurugan, & Sivaperuman, 2018) b UNESCO in response to the need for conservation of biodiversity along with its sustainable use. Biosphere reserves comprise terrestrial, marine and coastal ecosystems for the purpose of preserving genetic diversity in representative ecosystems by protecting wild animals, the traditi

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PROCEED
WWW.PROCEEDEVIDENCE.INFO

Systematic Map Protocol

Title
What evidence exists on the potential of Technosols constructed from mineral wastes to host biodiversity?

Citation:
Dakis-Yaoba Ouédraogo, Romain Sordello, Yorick Reyjol, Thomas Lerch. What evidence exists on the potential of Technosols constructed from mineral wastes to host biodiversity?: a Systematic Map Protocol. PROCEED-22-00018 Available from:
https://www.proceedevidence.info/protocol/view-result?id=18
https://doi.org/10.57808/proceed.2022.3

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Keywords
Anthroposol; Anthrosol; Circular economy; Constructed Technosol; Ecological engineering; Excavated materials; Urban construction wastes

Systematic map

Background
In 2018, an estimated 55.3 per cent of the world's population lived in urban settlements. By 2030, urban areas are projected to house 60 % of people globally and one in every three people will live in cities with at least half a million inhabitants [1]. The development of cities and transport infrastructures will produce a large volume of excavated materials. For instance, in France, the construction of the Grand Paris Express transport infrastructure will generate 45 million tonnes of these materials. The management of excavated materials, considered as wastes, has a substantial economic and environmental cost (e.g. greenhouse gas emissions), as they are most often stored in