

Section / sub-section	Topic	Description	Further explanation	Checklist/Meta-data	Author response	Comments
Title	Title	The title must indicate that it is a systematic map protocol, and must indicate if it is an update/amendment: e.g. "A systematic map update protocol: ...".	The title should normally be the same or very similar to the review question.	Meta-data	What evidence exists on the impact of sustainability initiatives on smallholder engagement in sustainable palm oil practices in Southeast Asia: A systematic map protocol.	
Type of review	Type of review	Select one of the following types of review: systematic map, systematic map update, systematic map amendment	See CEE Guidance on systematic mapping 111 and on amendments and updates 121	Meta-data	systematic map	
Authors contacts	Authors contacts	The full names, institutional addresses, and email addresses for all authors must be provided.		Checklist	Yes	
Abstract	Structured summary	Abstract must not exceed 350 words; and must include two sections 1) Background, the context and purpose of the review, including the review question; 2) Methods, how the review will be conducted and the endpoints that are expected (specifically mention search strategy, inclusion criteria, critical appraisal, data extraction and synthesis).		Checklist	Yes	
Background	Background	Describe the rationale for the review in the context of what is already known. Protocol must indicate why this study was necessary and what it aims to contribute to the field. The planned/actual role of stakeholders throughout the review process (e.g. in the formulation of the question) must be described and explained (using a broad definition of "stakeholder", including e.g. researchers, funders and other decision-makers; see [3]).	A theory of change and/or conceptual model can be presented that links the intervention or exposure to the outcome.	Checklist	Yes	This study uses the typology of sustainability initiatives on deforestation-free commodity supply chains (suggested by Wardell et al. 2022)
Stakeholder engagement	Stakeholder engagement			Checklist	Yes	See Methods and Searching Strategy sections.
Objective of the review	Objective	Describe the primary question and secondary questions (when applicable).	The primary question is the main question of the review. Secondary questions are usually linked to sources of heterogeneity (effect modifiers).	Checklist	Yes	What evidence exists on the impact of sustainability initiatives on smallholder engagement in the palm oil practices in Southeast Asia?
Methods	Definitions of the question components	Break down and summarise question key elements e.g. population, intervention(s)/exposure(s), comparator(s), and outcome(s).	For other question boxes see 14.S1	Meta-data	Population: Smallholding oil palm growers, including individuals and their households, in any Southeast Asia countries. Intervention: Investigations in relation to one or more of the defined palm oil sustainability initiatives (see Table 1). Comparator: Temporal (before/after the adoption of any initiative), spatial (between different sites), or between groups (control/intervention, socioeconomic, gender, racial/ethnic). Outcome: Positive, negative, or neutral effects of smallholder engagement in sustainability initiatives adoptions.	
Searches	Search strategy		Details regarding search strategy testing should be provided.	Checklist	Yes	
					Population terms ("smallhold"" OR "small hold"" OR "small hold"" OR "individual" OR "scheme" OR "small scale farmer"" OR "land owner") AND Management terms ("palm oil" OR "oil palm" OR "elaeis guineensis") AND Outcome terms ("engage"" OR "engaging" OR "empower"" OR "job"" OR "employ"" OR "share" OR "business"" OR "income"" OR "product"" OR "wealth"" OR "wellbeing"" OR "well being"" OR "market" OR "access" OR "security" OR "vulnerability"" OR "yield"" OR "inclusi"" OR "capital" OR "perception" OR "preference"" OR "awareness" OR "equity" OR "right"" OR "participate"" OR "sustainable"" OR "justice"" OR "community"" OR "involvement" OR "benefit"" OR "compensation" OR "trade off") AND Intervention terms ("sustainable"" OR "voluntary" OR "scheme"" OR "standard"" OR "certifi"" OR "partnership"" OR "agreement"" OR "initiative"" OR "initiative"" OR "initiative"" OR "regulatio"" OR "transverse"" OR "constraint"" OR "RISQ" OR "must"" OR "collaborate"" OR "pledge"" OR "assessment"" OR "multi-stakeholder"" OR "cooperate"" OR "best practice")	
	Search string	Provide Boolean-style full search string and state the platform for which the string is formatted (e.g. Web of Science format)		Meta-data		
	Language - bibliographic databases	List languages to be used in bibliographic database searches.		Meta-data	English	
	Language - env literature	List languages to be used in organizational websites searches and web-based search engines.		Meta-data	English	
	Bibliographic databases	Provide the number of bibliographic databases to be searched.		Meta-data		3 Web of Science, Scopus, and Garuda.
	Web - based search engines	Provide the number of web - based search engines to be searched.		Meta-data		5 Google Scholar
	Organisational websites	Provide the number of organisational websites to be searched.		Meta-data		13 See Table 2
	Estimating the comprehensiveness of the search	Describe the process by which the comprehensiveness of the search strategy was assessed (i.e. list of benchmark articles).	Optional. A search update is good practice if original searches were performed more than two years prior to review completion.	Checklist	Yes	The comprehensiveness of the search was measured by running it against the test library in three sources: Web of Science, Scopus, and Google Scholar. 87% or 34 of 39 studies were recovered.
Article screening and study inclusion criteria	Search update	Describe any plans to update the searches during the conduct of the review.		Checklist	No	The production of the map is planned to be completed within two years prior to review completion.
	Screening strategy	Describe the methodology for screening articles/studies for relevance/eligibility.		Checklist	Yes	
	Consistency checklist	Describe clearly the process for checking consistency of decisions including the levels at which consistency checking will be undertaken and estimated proportion of articles/studies that will be screened and checked for consistency by two or more reviewers (e.g. Titles (10%), abstracts (10%), full text (10%).		Checklist	Yes	
	Inclusion criteria	Describe the inclusion criteria used to assess relevance of identified articles/studies. These must be broken down into the question key elements (e.g. relevant subjects), intervention(s)/exposure(s), comparator(s), outcomes, study design(s) and any other restrictions (e.g. date ranges or languages).		Checklist	Yes	
	Reasons for exclusion	State that you will provide a list of articles excluded at full text with reasons for exclusion.		Checklist	Yes	
Critical appraisal	Critical appraisal strategy	Describe here the method you propose for critical appraisal of study validity (including assessment of individual studies and the evidence base as a whole).	Optional	Checklist	Yes	
	Critical appraisal used in synthesis	Describe how the information from critical appraisal will be used in synthesis.	Optional	Checklist	Yes	
	Consistency checking	Describe how repeatability of critical appraisal of study validity will be tested.	Optional	Checklist	Yes	
Data extraction	Meta-data extraction and coding strategy	Describe the method for meta-data extraction and coding for studies (potentially providing forms/data sheets (ideally piloted), list if variables to be extracted as meta-data and those that will be coded).		Checklist	Yes	See Additional Material 3
Data synthesis and presentation	Narrative synthesis strategy	Describe methods to be used for narratively synthesizing the evidence base in the form of descriptive statistics, tables (including SM database) and figures.	Vote-counting (tallying of studies based on the direction or significance of their findings) must be avoided. May include a summary of the subjects of critical appraisal of the evidence base as a whole if deemed to be performed in SM.	Checklist	Yes	
	Knowledge gap and cluster identification strategy	Describe the methods to be used to identify and/or prioritise key knowledge gaps (unrepresented or underrepresented subgroups that warrant further primary research) and knowledge clusters (well-represented subgroups that are amenable to full synthesis via systematic review).		Checklist	Yes	
	Demonstrating procedural independence	Describe the role of systematic reviewers (who have also authored articles to be considered within the review) in decisions regarding inclusion or critical appraisal of their own work.	Reviewers who have authored articles to be considered within the review should be prevented from unduly influencing inclusion decisions, for example by deliberative tasks asynchronous.	Checklist	Yes	
Declarations	Competing interests	Describe any financial or non-financial competing interests that the review authors may have.		Checklist	Yes	

References
[1] James, K.L., Bandula, N.P. and Haddaway, N.R. 2016. A methodology for systematic mapping in environmental sciences. *Environmental Evidence*, 5(1), p.7.
[2] Baylis, H.R., Haddaway, N.R., Eales, L., Thompson, G.K. and James, K.L. 2016. Updating and amending systematic reviews and systematic maps in environmental management. *Environmental Evidence*, 5(1), p.30.
[3] Haddaway, N.R., Valt, C., de Silva, N.R., Schramm, J., Spink, A., Stewart, R., Sweet, L.B. and Whitham, R. 2017. A framework for stakeholder engagement during systematic reviews and maps in environmental management. *Environmental Evidence*, 6(1), p.11.
[4] Collaboration for Environmental Evidence. 2018. Guidelines and Standards for Evidence Synthesis in Environmental Management. Version 5.0. www.environmentalevidence.org/information-for-authors.
[5] Leeds Institute of Health Sciences. https://medhealth.leeds.ac.uk/info/69/information_speciality/750/health_concept_tools. Accessed 12/11/2017.