

Agroecology and Indigenous peoples and territories: a systematic review protocol

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Abstract

Indigenous knowledge and Indigenous peoples' relationship with the environment play a crucial role in the conservation of biological and agricultural diversity but are also very vulnerable to global changes and pressures. Agroecology has been proposed as a set of principles aiming at making food systems and more generally, social-ecological relationships more resilient and equitable. While agroecological principles often claim to be inspired by Indigenous knowledge and values, little research has been performed on how agroecology interacts with Indigenous peoples and contexts in practice. This protocol sets up the foundation to fill this gap by systematically reviewing existing literature about the intersection of agroecology and Indigenous peoples and territories. The objective is to understand how existing studies from academic and gray literature describe and analyze the interplay and interactions between agroecology and Indigenous peoples and territories. We focus on 1) the scope and nature of these studies; 2) the characteristics of the described interactions in terms of context, support, outcomes, opportunities, and risks, and 3) how they address Indigenous knowledge, practices, and social movements as well as the scientific, practical, and political dimensions of agroecology. Following a clarification of the concepts of Indigenous peoples, territories and agroecology, we provide a search strategy to screen, appraise, extract, code and synthesize existing literature on the topic.

Keywords

Agroecological transitions, Indigenous territories, Indigenous knowledge, Scale-up, Scale-out, Scale deep

1. Background

Global challenges and the need for agroecology

The global food system is under immense pressure. Climate change, biodiversity loss, and deforestation are accelerating. Agricultural expansion is pushing past planetary boundaries, threatening climate stability, freshwater availability, and ecosystem integrity (Rippel et al. 2024). Food system vulnerabilities are further exposed by economic and environmental shocks, disrupting supply chains and threatening long-term resilience (Gaupp et al. 2021, Bezner Kerr et al. 2021). The dominant industrial agriculture models assume that technological innovations can override ecological limits, yet this assumption is increasingly contested (Rippel et al. 2024). Agroecology emerges as an alternative, offering a systemic response to multiple crises while promoting resilience, biodiversity, and socially more just and localized food systems (IPCC 2019; IPBES 2019; Wezel et al. 2009, Gallardo-López et al. 2018, Dagunga et al. 2023).

The role of agroecology and knowledge gaps

Understood as a “science, practice and social movement” (Wezel et al. 2009), agroecology provides a framework that integrates ecological principles with social and economic considerations. Despite its proven benefits (Wezel et al. 2009, Rosset et al. 2021), the application of agroecological principles remains a challenge. The benefits of agroecology are often confined to “islands of success” linked with well-networked, educated and relatively affluent communities, external support and productive environments (Sanderson Bellamy and Ioris 2017). The need to expand agroecology to contexts that do not count with these benefits has been identified as a major challenge (Sanderson Bellamy and Ioris 2017). In order to fully reach their potential, agroecological principles need to be scaled-up, namely be supported by higher policy levels, and scaled-out, namely expanding horizontally among producers and consumers and other actors (Gliessmann 2018).

Indigenous peoples, territories and food systems

Indigenous peoples, territories and food systems have potentially strong synergies with agroecology. On the one hand, their organizations, knowledge, practices and food habits may already be in line with principles of agroecology, giving an opportunity to scale-out agroecology. On the other hand, Indigenous communities are particularly vulnerable to the food system crisis and may also benefit from additional agroecological knowledge, practice and networks. The constitution and demarcation of Indigenous territories and land, started in the 1990s often involve norms, regulations and principles of land management. Indigenous territories could have affinities with “agroecological territories”, where collective decisions allow to expand the application of agroecological principles beyond farm or “island of success” level (Rosset et al. 2021) and thus represents an opportunity to scale- agroecology.

Yet connecting Indigenous communities and territories with agroecology also bears risks. Agroecology is often linked with external actors such as NGOs, governments, etc. that work following a project logic. Under the banner of agroecological principles, these actors may impose an external worldview and biased understanding of local ecological interactions that could erode local knowledge (Rosset et al. 2021, Marfurt et al. 2023). They

may also create dependencies from external and intermittent funding (Boillat et al. 2021). For many Indigenous peoples, agriculture itself may be an alien notion, especially those with stronger tradition of hunting, fishing and gathering. This questions the options for agroecology to “decolonize itself” and be capable of understanding other forms of conceptualizing human-environment interactions (Price et al. 2022).

Agroecology and Indigenous knowledge systems are widely discussed in academic and policy circles. Yet there is little systematic understanding of how their interaction is described, analysed, and put into practice in empirical studies. This review looks specifically at literature on such interactions in Indigenous territories or with Indigenous peoples. It examines their scope, main features, and how different forms of knowledge are brought together. By moving from broad debate to this defined body of evidence, the review addresses a clear gap and creates a sound basis for future research and practice.

The meaning of agroecology in Indigenous contexts

In possible interactions with Indigenous communities, agroecology can have different meanings. Agroecology as a concept, a “signifier” exists since the early XXth Century. The concept can be mobilized by different actors including Indigenous peoples themselves but also external actors who interact with them. In this sense, agroecology can be framed as a *transformative* concept, namely as a set of principles aimed at transforming food systems. This is what some call “intentional agroecology” of the “short trajectory” of agroecology (Wezel et al. 2009, Catacora-Vargas et al. 2018).

Nevertheless, the concept of agroecology can also be used to *interpret* an existing system. One can apply the concept as a “signified” to identify existing practices, principles and networks that are aligned to the principles of agroecology, even when the actors who support them do not use the concept of agroecology (Lucas 2021). One can ask how people enhance soil health or social-ecological interactions in agriculture, for example. In this case, “agroecology” is used to qualify practices and systems that may exist since agriculture exists and even beyond. This is what some call “traditional agroecology” or the “long trajectory” of agroecology (Catacora-Vargas et al. 2018, Rosset et al. 2021).

In this study, we focus on the interaction of “intentional” and “traditional” agroecology in indigenous territories contexts. We take the interaction between Indigenous communities and territories with “intentional” agroecology as a starting point, focusing on studies that explicitly use the term. Nevertheless, studies that interpret Indigenous contexts in light of the concept of agroecology also represent a mobilization of agroecology in a conceptual sense. For this reason, we also inquire about existing practices that are affine with agroecology but that Indigenous communities do not necessarily label as such, as long as they are conceptualized as “agroecological” in literature (Price et al. 2022).

2. Conceptual framework

Clarification of concepts

a) Indigenous peoples

There are many definitions of Indigenous peoples and the concept is highly controversial, with governments often attempting to define who can and who cannot be Indigenous, and social groups and individuals claiming or not Indigenous identity. For example, the UN-ECOSOC report by José Martínez Cobo consider Indigenous peoples as diverse social groups that share characteristics such as prior occupancy of a territory, the voluntary perpetuation of cultural distinctiveness, self-identification as a distinct collectivity, and an experience of domination, subjugation, dispossession, or discrimination (Martínez Cobo, 1986). International regulations recognize the right of Indigenous peoples to determine their own identity or membership in accordance with their customs and traditions and considers self-identification as the fundamental criterion for determining who may or not belong to Indigenous peoples (ILO Convention No. 169-Art.1, 1989; UNDRIP, 2007). The broader term “Indigenous peoples and local communities” (IPLC) is also used to include people that are not necessarily the earliest inhabitants of an area but who “maintain an inter-generational historical connection to place and nature through livelihoods, cultural identity, languages, worldviews, institutions, and ecological knowledge” (IPBES, 2019)

These definitions leave strong room for interpretation. Each country including governments as well as the Indigenous peoples, organizations, groups and individuals who live there use their own definitions of Indigenous. In this review, we chose to assess the literature that explicitly refers to people that are early inhabitants (not necessarily the first ones) in an area, as in ILO definition also used by Garnett et al. (2018). We use the terms of “Indigenous”, “Aboriginal”, (used in the Americas, Oceania and worldwide) “First Nations”, “Native American” (used in North America) and “tribe” (used in South Asia). Though we acknowledge that other local communities may have a strong connection to nature, including them would make the search too broad and yield too many results difficult to interpret.

b) Indigenous territories

Indigenous or traditional territories describe the ancestral and contemporary connections of Indigenous peoples to a *geographical area* (The Canadian Encyclopedia <https://www.thecanadianencyclopedia.ca/en/article/indigenous-territory>). Indigenous territories might enjoy different degrees of government recognition and in different forms (land titles, autonomous jurisdictions, etc.) (Baragwanath and Bayi 2020; Boillat et al. 2022). More generally, territories have different types of demarcation in space (formal/informal, continuous/discontinuous, etc.) and can be tied with environmental regulations (e.g. protected areas, convention of environmental stewardship, co-management, etc.) (Giraut 2008). Indigenous peoples and territories might not necessarily overlap in space, with many Indigenous persons living outside of the territories they consider traditional, while also non-Indigenous persons might live in these lands, representing or not a threat to Indigenous peoples. These territorial and legal frameworks are also important

enabling conditions for agroecology, shaping how practices scale-out across landscapes, scale-up into institutions, and scale-deep by embedding agroecological values within Indigenous governance systems.

c) **Agroecology**

In contrast to other concepts linked with ecological aspects of agriculture, agroecology encompasses a broad set of ecological, social and political aspects and builds on a wide international network linking farmers, social movements, support organizations and scientists. The following aspects stand out from the existing literature on agroecology:

Elements and principles of agroecology (FAO 2008; HLPE 2019; Wezel et al. 2020): Through a worldwide participatory process led by UN agencies, agroecology has been defined as a set of elements and principles that are observable at farm, community and food system levels. Agroecological principles refer to a core set of interconnected concepts that guide agroecological transformations. These include: diversity, synergies, efficiency, resilience, recycling, co-creation and sharing of knowledge, human and social values, culture and food traditions, responsible governance, and circular and solidarity economy. The Food and Agriculture Organization of the United Nations (FAO) first articulated these ten elements in 2018 to support the transition to sustainable food and agricultural systems (FAO 2018). Then, the High Level Panel of Experts on Food Security and Nutrition (HLPE) subsequently expanded and synthesized these principles in a 2019 report, highlighting their practical and policy relevance for food system transformation (HLPE 2019). The HLPE principles encompass the wider dimensions of resilience, resource efficiency and social equity (connecting with the ecology, economy, social “triple bottom line” of sustainability) at farm and food system level. The elements and principles of agroecology focus on the **target values** of agroecology: what is considered agroecological and not in the sense of a transformation aimed at that can be adapted to each context.

Agroecology as a science, a practice and a social movement (Wezel et al. 2009; 2020). This includes a) the study of the “ecology of the food system”, principles of design and transdisciplinary integration, b) practices that intend to improve agricultural systems by creating beneficial ecological interactions and minimize synthetic inputs; c) those who advocate for agroecology and the political transformations to enhance it. This definition focuses on the **actors** who carry out agroecology: the researchers, the practitioners and the advocates.

Agroecological transitions and transformations (e.g. Duru et al. 2015; Olliver and Bellon 2018) This focus addresses the **processes** that lead from “unsustainable” food systems to more sustainable ones following the elements and principles of agroecology and carried by the actors of agroecology. In this framing, agroecology is implicitly or explicitly framed as an innovation that leads from one state of the system to another one (e.g. “socio-technical transition”, Olliver et al. 2018). Some interpretations of agroecology focus on building on traditional knowledge (Altieri and Toledo 2005), while others consider agroecology as the “ecological

modernization” of agriculture (Tomich et al. 2011). Research on adoption of agroecological innovations also addresses how ideas and practices emerge from a local context to a larger scale, including the notions of up-scaling (impacting laws and policy), out-scaling (impacting greater numbers of people and areas of land) and deep-scaling (changing cultural values and beliefs) (Moore et al. 2015; Gliessmann, 2018; Nicol 2020).

Conceptual model of interactions between agroecology and Indigenous peoples and territories

The interaction between agroecology and IPLC contexts can take many forms. In our analysis, we distinguish two possible framings of agroecology:

- **A.** Transformative agroecology. Agroecology framed as an innovation, a new concept encompassing a set of principles and elements that is brought to a local context via internal or external actors, or an alliance of the two. In this case **agroecology is an option for [Indigenous] people to transform their food systems and/or reclaim them**. Here agroecology refers to the “short trajectory”, is usually explicit as a concept and one can ask what the actors understand as agroecology. Here the focus is on transformation/development. The main issue is socio-cultural acceptability, question of why practices are adopted, etc. The actors who bring the concept of agroecology are typically extensionists, development workers or local promoters.

- **B.** Interpretative agroecology. Agroecology is used to describe an already existing system, without the explicit aim to transform it. Aspects of local food systems are labelled, claimed or characterized as “agroecological”. In this case, **“agroecology is something [Indigenous] people already do”**. Relevant aspects can be ancestral knowledge, traditional practices, forms of organization or movements with historic continuity that are affine to the principles of agroecology, but that local actors do not necessarily name as such. Studies based on interpretative agroecology usually do not explicitly focus on transforming systems. However, they may have an indirect transformative objective by advocating for the recognition of “agroecological Indigenous systems”: what can be considered agroecology and what not? By whom? Doing research without pretending to transform practices or principles also has an impact and can lead to enhance or dismiss practices through their recognition as being “agroecological” or not. Here the actors who bring the concept of agroecology are typically researchers and authors of studies, who can sometimes also belong to the Indigenous community (e.g. Price et al. 2022).

In practice, these framings often interact, and agroecology is used to both interpret and transform. Then, **agroecology is an interaction between tradition and innovation** and different actors conceptualize what people already do and what they can change. The main issue is the interaction between different forms of knowledge and power relationships. Some actors promoting agroecology acknowledge that Indigenous food systems share principles with agroecology, but also that agroecology can help Indigenous peoples to address the challenged that their food system face (Rúa, 2023). Here, ideally, agroecology and Indigenous peoples and territories strengthen each other, but this depends on how uneven power relationships are addressed.

Studies that look at Indigenous food systems that are affine to agroecology, without using the concept would need a too broad scope that cannot be captured in our search strategy and are therefore outside the scope of this study. [e.g. a search based on the 10 elements and 13 principles of agroecology and Indigenous peoples yields >40'000 results].

Theory of change model

With these three possible framings, we propose a “theory of change” in which the “intervention” (in the sense of a complex intervention to a complex system; Booth et al. 2019) is the application of the concept of agroecology to the context of Indigenous peoples and territories (Table 1). The use of the concept can be transformative (e.g. project promoting agroecology, case A), or discursive-conceptual (case B), or both. We therefore focus on studies that apply the concept of agroecology to Indigenous peoples and territories contexts and are located in a continuum of transformative to interpretative focus.

Figure 1 shows the interplay between indigenous peoples, territories and agroecology though a theory of change model that captures the context and possible effects of an “intervention”. Here we mean as the “change” the application of the concept of agroecology to an Indigenous peoples and/or territory context. The application can involve physical initiatives of “agroecological development” but can also be only conceptual, with the concept of agroecology used to understand and interpret a context or characterize a potential.

We do not focus on gathering evidence on effects, outcomes or impacts, but rather on how agroecology is framed and characterized in the available literature.

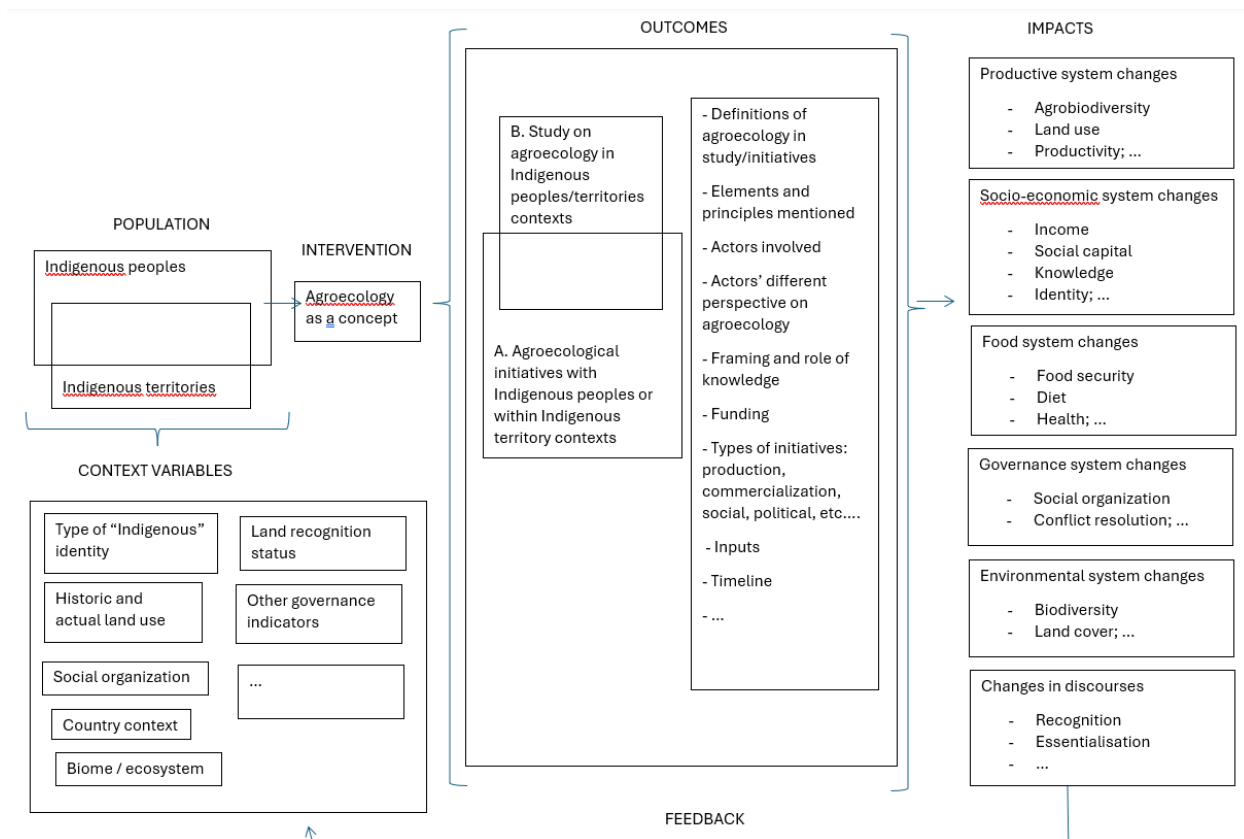


Figure 1: theory of change framing “agroecology” as an “exposure” to Indigenous peoples and territories

3. Review objective and research questions

3a. Question

The proposed main research question is:

How do studies describe and analyze the interplay/interactions between agroecology, Indigenous peoples, and territories?

Secondary research questions include:

Sub1: *What is the scope and nature of studies that examine, describe or promote agroecology in Indigenous territories and in relation to Indigenous peoples?*

Sub2: *What are the characteristics of these described interactions in terms of context, support, outcomes, opportunities, and risks?*

Sub3: *How do existing studies address Indigenous knowledge, practices, and social movements, and the scientific, practical, and political dimensions of agroecology?*

3b. Components of the research question

The review has the following question elements:

Population: Scientific research articles and grey literature in which agroecology is used to describe and/or transform Indigenous food systems contexts. Studies both within and outside of Indigenous territories are included.

Outcome : Descriptions of interactions between agroecology and Indigenous peoples and territories, including integration of knowledge forms and dimensions of agroecology.

Study type: Any research study or project description that applies the concept of agroecology to Indigenous peoples and territories context.

4. Stakeholder's role in the review

This is a public good review. The research questions originated from a broader project “Indigenous agroecological territories (INDAGAR), a potential for up-scaling sustainable and just food system transformation”, which has the overall objective to investigate the intersection between agroecology and Indigenous lands, communities, and movements. The project works at global scale (this study), and, focusing on the example of Bolivia, national scale and local scale with three case studies in this country.

5. Searching for articles

5a. Searching bibliographic databases

The search will be conducted on the following bibliographic databases: Web of Science (including all collections), Scopus, Cairn.info and Persée. A detailed list of collections included in each database is available in Annex 16b.

5b. Searching for grey literature

We will search grey literature from the websites of 19 organisations that were identified as possible sources of relevant records (Table 1).

Table 1: list of organization names with URL

Organisation name	URL
Food and Agriculture Organization (FAO)	https://openknowledge.fao.org
International Labour Organization (ILO)	https://www.ilo.org/
La Via Campesina	https://viacampesina.org/en/
Agroecology Coalition	https://agroecology-coalition.org/
Agroecology Now!	https://agroecologynow.net/
Agroecology Fund	https://agroecologyfund.org/
Sociedad Científica Latinoamericana de Agroecología (SOCLA)	https://www.soclaglobal.com/about

Agroecology in Action (Miguel Altieri's blog)	https://agroeco.org/
BioVision	https://www.biovision.ch/
AgEcon	https://ageconsearch.umn.edu
Commonwealth Scientific and Industrial Research Organization (CSIRO)	https://www.csiro.au/
Gardian (searches 15 CGIAR websites)	https://gardian.bigdata.cgiar.org
CGIAR – CGSpace	https://cgspace.cgiar.org
International Fund for Agricultural Development (IFAD)	https://www.ifad.org/
JPAL/ATAI impact evaluations (IPA)	https://www.povertyactionlab.org/
Overseas Development Institute (ODI)	https://odi.org
United Nations Environment Programme (UNEP)	www.unep.org/publications-data
World Bank Open Knowledge Repository	https://openknowledge.worldbank.org/
World Health Organization (WHO)	https://iris.who.int
World Food Programme (WFP)	https://ww.wfp.org/publications

5c. Justification of search limits

No temporal or geographical restrictions will be used. The search will be limited to English, Spanish, Portuguese, French, German and Italian as these are the languages known to the authors. There will be no other restrictions for the search.

5d. Search string

The search will focus on the two key concepts of the review, 1) Indigenous peoples and Indigenous knowledge and practices and 2) agroecology (Table 2). Keywords representing both of these concepts and synonymous or related terms, such as 'traditional ecological knowledge' are included. Boolean operator AND will be used to combine the terms appropriately. The translation of the terms to Spanish, Portuguese, French, and German are available on Annex 16c.

Some relevant studies may refer to specific Indigenous groups by name without using general terms like "Indigenous" or "First Nations." These may not be captured by our initial search string but can be identified through backward/forward citation tracking of included papers.

Table 2: search strings used with obtained hits

Line	Search string - English
#1 Indigenous	(Indigenous OR Aboriginal OR "First Nations" OR tribe* OR "Native American")

#2 Knowledge and practices	(Indigenous OR Aboriginal OR "First Nations" OR tribe* OR "Native American") AND ("traditional ecological knowledge" OR "local ecological knowledge" OR "local knowledge" OR "ancestral knowledge" OR "ancestral practices" OR "local practices" OR "local ecological practices" OR "traditional ecological practices")
#3 World vision	(Indigenous OR Aboriginal OR "First Nations" OR tribe* OR "Native American") NEAR/10 (cosmovision OR world\$view OR "epistemic justice" OR decolonial* OR postcolonial OR "food sovereignty" OR "peasant movement*" OR "dialogue of knowledges")
#4	#1 OR #2 OR #3
#5 Agroecology	agro\$ecolog*
#6	#4 AND #5

5e. Comprehensiveness of search - benchmark papers

The draft search string was tested against a benchmark list of 10 articles of known relevance to assess the comprehensiveness (annex 16a). All the benchmark articles were found with the tested search string.

5f. Managing results

All searches will be recorded and the details reported in the review. Bibliographic database search results will be compiled in EndNote where they will be de-duplicated. After de-duplication, the records will be uploaded to Rayyan (<https://www.rayyan.ai/>) for screening.

5g. Intention to update search

We plan to finalise the review within 10 months of the original search and hence, do not plan to update the search.

5h. Citation searching & reference list checking

We will conduct citation chasing (forwards and back) using the benchmark articles and articles included in the final review. Furthermore, we will check reference lists of all relevant reviews identified during screening. We will use citationchaser (Haddaway et al. 2022) to conduct the citation chasing and de-duplicate the results against the initial search. The remaining records will be screened and eligible studies included in the final review.

6. Article screening

6a. Eligibility criteria for including studies

Population: Scientific research articles and grey literature in which agroecology is used to describe and/or transform Indigenous food systems contexts. Studies both within and outside of Indigenous territories are included.

Outcome : Studies that have an explicit description of interactions between agroecology and Indigenous peoples and territories, including integration of knowledge forms and dimensions of agroecology.

Study type: Any primary research study or project description that applies the concept of agroecology to Indigenous peoples and territories context. Commentaries and similar types of articles are included only if they concern a specific location.

6b. Screening process

We will screen all potentially relevant records (papers and documents) at two levels, title and abstract level and full text level. We plan to use the software Rayyan (<https://www.rayyan.ai/>) to undertake the screening process. Review team members will not make any decisions on articles they have authored during the review process.

6c. Sharing of screening

The evidence base will be screened in full by at least two reviewers. Before screening at each stage, a subset of records will be simultaneously and independently screened to establish consistency in screening decisions.

6d. Checking consistency of screening decisions

Before screening at each stage, a subset (random sample) of records (200 at title and abstract and 20 at full text) will be simultaneously and independently screened by all reviewers undertaking screening. Results will be compared, and all disagreements discussed. Other team members will be consulted and further details added to the inclusion criteria where necessary. Fleiss' Kappa will be calculated to assess alignment in screening decisions. If the kappa score exceeds 0.7, the remaining records will be divided among the reviewers and screened independently. If the kappa score is below 0.7, further set(s) of 100 records will be screened until alignment is achieved. Results of the consistency checking will be reported in the final review.

6f. Reporting reasons for exclusion

Exclusion reasons will be reported for all records excluded after full text assessment. At least one of the following exclusion reasons must be reported:

- Ineligible population (studies looking at ecological aspects of Indigenous practices and norms without relation with agroecology).
- Ineligible outcome (study does not explicitly describe interactions between agroecology and Indigenous peoples or territory).
- Ineligible study type
- Ineligible language

7. Data extraction and coding

7a. Data extraction process

All articles eligible at full text will be subject to data coding (allocation of predefined categorical labels) and meta-data extraction (descriptive information). The information that we aim to record for each article are detailed in Table 3.

7b. Consistency checking for construct validity and error checking

Data from the first five articles will be extracted simultaneously and independently by team members undertaking data extraction. Extracted data will be compared, and where necessary constructs discussed and clarified.

7c. Data to be extracted

Table 3 outlines the data to be extracted from articles eligible at full text. Corresponding author of the article will be contacted for clarification in case of unclear data.

Table 3: List of data to be extracted from the included articles.

Item	Description	Type (meta-data or coding)
Citation	Author, Year, Title, Source, DOI, Language, Type of publication (journal article, report, book, etc.)	Meta-data
General context information		
Country	Country name (English short name, lower case, ISO 3166; https://en.wikipedia.org/wiki/ISO_3166-1)	Meta-data
Location (region/city, urban/rural)	Description of the target location	Meta-data
Biome	One Earth classification scheme (14 categories https://commons.wikimedia.org/wiki/Category:List_of_Biomes_(One_Earth))	Meta-data
Indigenous context information		
Indigenous language/ethnicity	Language code following Ethnologue https://www.ethnologue.com/database	Meta-data
Historic land use	Agriculture, pastoralism, agro-pastoralism, hunter-gatherers, fishing, others	Meta-data
History of contact	Pre-colonial ; 1500-1750 ; 1750-1900 ; 20th Century ; Initial contact/PVI	Meta-data
Land recognition status	Autonomous jurisdiction; collective land title ; reservation ; no recognition	Meta-data
Social organization type/governance	textual description [to be coded inductively]	Meta-data
Framing of agroecology		
Definition/focus of agroecology	Science, practice, social movement, other (combinations possible)	Coding
Interaction AE-IPLCs	Agroecology as innovation, as existing conditions, or both	Coding
Level of food system integration mentioned	Levels 1-5 (Gliesmann): develop	Coding
Principles of agroecology mentioned	13 principles according to HLPE: develop	Coding

Elements of agroecology mentioned	10 elements according to FAO: develop	Coding
Characteristic of Study/Initiative		
Lead/ Actors involved	Indigenous organization, NGO, government, private sector, ...	Meta-data
Funding	Local, government, NGO, ppp, etc.	Meta-data
Production objective (if applicable)	Self-sufficiency, local markets, export	Meta-data
Input promotion (if applicable)	Types of inputs promoted	Meta-data
Species (if applicable)	Types of crops and breeds promoted	Meta-data
Landscape integration (if applicable)	Types of integration with wider landscape use (forestry, reforestation, hunting, fishing, etc.)	Meta-data
Time frame	Time frame of initiative (if applicable)	Meta-data
Framing and role of knowledge		
Main framing	External, internal, co-production, other	Coding
Participation level	Level according to Arnstein's scale or other "participation scales" https://organizingengagement.org/models/ladder-of-citizen-participation/	Coding
[Impacts, if described in study]		
Impacts	production, economy, social, health, governance, cultural, biodiversity, climate, others (yes or no, mentioned in study)	Meta-data

8. Risk of bias assessment

We will not conduct risk of bias assessment as we are interested in all explicit descriptions and framing, and treat them as equally valid evidence for the purposes of this review.

9. Synthesis

9a. Review process

We will report screening outcomes using a ROSES diagram (Haddaway et al., 2017). We will provide a list of articles excluded at full text with reasons for exclusion. Finally, we will include a list of all eligible studies in the final review.

9b. Narrative synthesis methods/Description of the evidence base

We will produce a narrative synthesis to describe the evidence base including knowledge clusters and information gaps. We will use tables and visualizations, such as descriptive plots and heatmaps, to describe the meta-data and data on study findings. Visual representations will include, for example: 1) a global map of existing studies including country, Indigenous peoples involved and main biome; 2) a heatmap showing the proportional frequency of agroecological elements, principles and actors mentioned in Indigenous contexts; 3) a sankey diagram focusing on land recognition status and its possible relation with agroecological

initiatives, and 4) a visual showing the level of participation and knowledge co-production according to different contexts.

9c. Synthesis of study findings

We will provide a summary of the different framings of agroecology used in Indigenous contexts and territories. We will make a typology of agroecological framings ranging from purely transformative to purely interpretative focus, highlighting contexts parameters that may favour one side or the other of the continuum.

Also depending on the findings, we will perform a thematic analysis identifying recurring ideas, concepts and relationships across the board/dataset. This will possibly include an inductive coding process and a description using quotes and visuals such as word clouds, network graphs and code maps.

Possible relationships between contexts, framings and projects will feed a discussion on what the key aspects of interactions between agroecology and Indigenous contexts and territories are: e.g. is Indigenous knowledge better recognized among IP with agricultural tradition? Are there regional clusters of in interactions between IP and agroecology? Are specific principles of agroecology framed as more important than others in IP contexts? How does territorialization play a role in promoting agroecology?

We will discuss our findings in relation with existing critical literature on agroecology in Global South and Indigenous peoples' context. This includes literature on "colonial vs. decolonial" agroecology (Marfurt et al. 2023); agroecology as tradition vs. innovation (Levidow et al., 2014), knowledge co-production experiences (Coolsaet 2016), human and social values linked with agroecology (Bezner Kerr et al. 2022) and the overall prospects of agroecology to transform and/or recognize Indigenous food systems as a contribution to sustainability and resilience.

10. Author contribution statement

SB = Sébastien Boillat, POW = Patrick O. Waeber, SF = Sofia Foladori-Invernizzi, SS = Sini Savilaakso, ES = Elvira Serrano, CJ = Christine Jurt

Conceptualisation: all; methodology: SS, POW; writing—original draft preparation: SB, POW, SF; writing—review and editing: all; supervision: SB, SS; project administration: SB, CJ; funding acquisition: SB, ES, CJ. All authors have read and agreed to the published version of the manuscript.

11. Conflict of interest

The authors declare no conflict of interest.

12. Acknowledgements

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13. Procedural objectivity

Team members who have authored articles relevant to the topic will not make decisions regarding their own work. Instead, any article authored by a team member will be assigned to other team members for screening and data extraction.

14. Funding

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16. Annexes

16a. List of benchmark studies

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Galicia Gallardo AP, Ceccon E, Castillo A, González-Esquivel CE. 2020. Resisting socio-ecological vulnerability: agroecology and indigenous cooperativism in La Montaña, Guerrero, Mexico, *Agroecology and Sustainable Food Systems* <https://doi.org/10.1080/21683565.2020.1793871>

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Grey S, Patel R. 2015. Food sovereignty as decolonization: some contributions from Indigenous movements to food system and development politics. *Agriculture and Human Values* 32: 431–444.

<https://doi.org/10.1007/s10460-014-9548-9>

Intriago Barreno R, Gortaire Amézuca R, Bravo E, O’Connell C. Agroecology in Ecuador: Historical Processes, Achievements and Challenges. *Agroecology and Sustainable Food Systems*. 41: 311-328.

<https://doi.org/10.1080/21683565.2017.1284174>

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Suarez-Torres J. et al. 2017. Agroecology and Health: Lessons from Indigenous Populations. *Curr Envir Health Rpt* (2017) 4:244–251. DOI 10.1007/s40572-017-0146-z

16b. Collections included in each database

From Web of Science database, all collections will be included as specified in the list below. This has information dating back to 1637.

- WoS core collection
- Arabic Citation Index
- Biological Abstract
- BIOSIS Citation Index
- BIOSIS Previews
- CABI: CAB Abstracts and Global Health
- Chinese Science Citation Database
- Current Contents Connect
- Data Citation Index
- Derwent Innovations Index
- FSTA The Food Service Resource Help
- Inspec
- KCI Korean Journal Database
- MEDLINE
- Preprint Citation Index
- Proquest Dissertations & Theses Citation Index
- SciELO Citation Index
- Zoological Record

From Scopus database the information dates back to 1970.

Cairn.info sciences humaines et sociales <https://shs.cairn.info/>

Persée <https://www.persee.fr/>

16c. Search strings in Spanish, Portuguese, French, and German

Spanish search string

Line	Search string
#1 Indigenous	(Indígena OR Aborigen OR "Primeras naciones" OR tribu* OR "Nativo americano")
#2 Knowledge and practices	(Indígena OR Aborigen OR "Primeras naciones" OR tribu* OR "Nativo americano") AND ("conocimiento* ecológico* tradicional*" OR "conocimiento* ecológico* local*" OR "conocimiento* local*" OR "conocimiento* ancestral*" OR "prácticas ancestrales" OR "prácticas locales" OR "prácticas ecológicas locales" OR "prácticas ecológicas tradicionales")
#3 World vision	(Indígena OR Aborigen OR "Primeras naciones" OR tribu* OR "Nativo americano") NEAR/10 (cosmovisión OR "visión de\$ mundo" OR "justicia epistémica" OR de\$colonial* OR poscolonial* OR "soberanía alimentaria" OR "movimiento campesino" OR "diálogo de conocimientos")
#4	#1 OR #2 OR #3

#5 Agroecology	agroecol*
#6	#4 AND #5

Portuguese search string

Line	Search string
#1 Indigenous	(Indígena OR Aborígene OR "Primeiras Nações" OR tribo* OR "Nativo americano" OR amerindio)
#2 Knowledge and practices	(Indígena OR Aborígene OR "Primeiras Nações" OR tribo* OR "Nativo americano") AND ("conhecimento* ecológico* tradiciona*" OR "conhecimento* ecológico* loca*" OR "conhecimento* loca*" OR "conhecimento* ancestra*" OR "saber* ecológico* tradiciona*" OR "saber* ecológico* loca*" OR "saber* loca*" OR "saber* ancestra*" OR "práticas ancestrais" OR "práticas locais" OR "práticas ecológicas locais" OR "práticas ecológicas tradicionais")
#3 World vision	(Indígena OR Aborígene OR "Primeiras Nações" OR tribo* OR "Nativo americano") NEAR/10 (cosmovisão OR "visão de mundo" OR "justiça epistêmica" OR de\$colonial* OR "pós-colonial*" OR "soberania alimentar" OR "movimento camponês" OR "diálogo de conhecimentos")
#4	#1 OR #2 OR #3
#5 Agroecology	agroecol*
#6	#4 AND #5

French search string

Line	Search string
#1 Indigenous	(Autochtone* OR Aborigène* OR "Premières Nations" OR tribu* OR Amérindien* OR Indigène*)
#2 Knowledge and practices	(Autochtone OR Aborigène OR "Premières Nations" OR tribu* OR Amérindien OR Indigène*) AND ("connaissance* écologique* traditionnel*" OR "connaissance* écologique* locale*" OR "connaissance* locale*" OR "connaissance* ancestrale*" OR "savoir* écologique* traditionnel*" OR "savoir* écologique* loca*" OR "savoir* loca*" OR "savoir* ancestrale*" OR "pratique* ancestrale*" OR "pratique* locale*" OR "pratique* écologique* locale*" OR "pratique* écologique* traditionnelle*")
#3 World vision	(Autochtone OR Aborigène OR "Premières Nations" OR tribu* OR Amérindien OR Indigène*) NEAR/10 (cosmvision OR "vision du monde" OR "justice épistémique" OR décolonial OR décolonisation OR postcolonial OR "souveraineté alimentaire" OR "mouvement paysan*" OR "dialogue de* savoirs")
#4	#1 OR #2 OR #3
#5 Agroecology	agroécologi* OR agro-ecologi*
#6	#4 AND #5

German search string

Line	Search string
#1 Indigenous	(indigene OR aborigines OR "First Nations" OR "Stamm" OR "Stämme" OR "Native American"" OR "einheimisch*" OR "Urvolk" OR "Urvölker" OR "Ureinwohner")
#2 Knowledge and practices	(indigene OR aborigines OR "First Nations" OR "Stamm" OR "Stämme" OR "Native American"" OR "einheimisch*" OR "Urvolk" OR "Urvölker" OR "Ureinwohner") AND ("traditionelles ökologisches wissen" OR "lokales ökologisches wissen" OR "lokales wissen" OR "überliefertes wissen" OR "überlieferte pratiken" OR "lokales praktiken" OR "lokale ökologische Praktiken" OR "einheimische ökologische Praktiken" OR "traditionelle Praktiken" OR "traditionelle ökologische Praktiken")
#3 World vision	(indigene OR aborigines OR "First Nations" OR "Stamm" OR "Stämme" OR "Native American"" OR "einheimisch*" OR "Urvolk" OR "Urvölker" OR "Ureinwohner") NEAR/10 (Kosmvision OR Weltanschauung OR "epistemische Gerechtigkeit" OR dekolonial* OR postkolonial OR "Ernährungssouveränität" OR "Bauernbewegung*" OR wissensdialog OR "Dialog der Wissensdialog")
#4	#1 OR #2 OR #3
#5 Agroecology	Agrarökologie*
#6	#4 AND #5

16d. ROSES Checklist

Attached as a separate file.

Item number	Section / sub-section	Topic	Description	Further explanation	Checklist/Meta-data	Author response	Comments
1	Title	Title	The title must indicate that it is a systematic review protocol, and must	The title should normally be the same or very similar to the review	Meta-data	Agroecology and indigenous peoples and territories: a systematic review protocol	
2	Type of review	Type of review	Select one of the following types of review: systematic review,	See CES Guidance on amendments and updates [1]	Meta-data	systematic review	
3	Authors contacts	Authors contacts	The full names, institutional addresses, and email addresses for all		Checklist	Yes	
4	Abstract	Abstract	Abstract must not exceed 350 words and must include two sections [1]		Checklist	Yes	
5	Background	Background	Describe the rationale for the review in the context of what is already	A theory of change and/or conceptual model can be presented that links	Checklist	Yes	
6	Stakeholder engagement	Stakeholder engagement	The planned/actual role of stakeholders throughout the review process		Checklist	Yes	
7	Objective of the review	Objective	Describe the primary question and secondary questions (when	The primary question is the main question of the review. Secondary	Checklist	Yes	
8		Definitions of the question	Break down and summarise question key elements e.g. population,	For other question types see [3,4]	Meta-data		Population: Scientific research articles and grey literature in which agroecology is used to describe and/or transform Indigenous food systems contexts. Studies both within and outside of Indigenous territories are included. Outcome: Descriptions of interactions between agroecology and Indigenous peoples and territories, including integration of knowledge forms and dimensions of agroecology. Study type: Any research study or project description that applies the concept of agroecology to Indigenous peoples and territories context.
Methods							
9	Searches	Search strategy	Detail the planned search strategy to be used, including: database names	Details regarding search strategy testing should be provided.	Checklist	Yes	
10		Search string	Provide Boolean-style full search string and state the platform for which		Meta-data	Provided p.10 of the protocol and translations in Annex 16c	
11		Languages – bibliographic	List languages to be used in bibliographic database searches.		Meta-data	English, Spanish, Portuguese, French, and German	
12		Languages – grey literature	List languages to be used in organizational websites searches and web-		Meta-data	As above depending on the organisation.	
13		Bibliographic databases	Provide the number of bibliographic databases to be searched.		Meta-data	21; list provided in Annex 16b	
14		Web – based search engines	Provide the number of web – based search engines to be searched.		Meta-data		0
15		Organisational websites	Provide the number of organisational websites to be searched.		Meta-data		20
16		Estimating the comprehensiveness	Describe the process by which the comprehensiveness of the search		Checklist	Yes	
17		Search update	Describe any plans to update the searches during the conduct of the	Optional. A search update is good practice if original searches were	Checklist	Yes	
18	Article screening and study	Screening strategy	Describe the methodology for screening articles/studies for		Checklist	Yes	
19		Consistency checking	Describe clearly the process for checking consistency of decisions		Checklist	Yes	
20		Inclusion criteria	Describe the inclusion criteria used to assess relevance of identified		Checklist	Yes	
21		Reasons for exclusion	State that you will provide a list of articles excluded at full text with		Checklist	Yes	
22	Critical appraisal	Critical appraisal	Describe here the method you propose for critical appraisal of study		Checklist	No	We will not conduct risk of bias assessment as we are interested in all explicit descriptions and framing, and treat them as equally valid evidence for the purposes of this review.
23		Critical appraisal strategy	Describe how the information from critical appraisal will be used in		Checklist	No	
24		Consistency checking	Describe how repeatability of critical appraisal of study validity will be		Checklist	No	
25	Data extraction	Meta-data extraction and coding	Describe the method for meta-data extraction and coding for studies		Checklist	Yes	
26		Data extraction strategy	Describe the method for extraction of qualitative and/or quantitative		Checklist	Yes	
27		Approaches to missing data	Describe any processes for obtaining and confirming missing or unclear		Checklist	Yes	
28		Consistency checking	Describe how repeatability of the meta-data/data extraction process will		Checklist	Yes	
29	Potential effect modifiers/reasons	Potential effect modifiers/reasons	Provide a list of and justification for the effect modifiers /reasons for	The list should not be exhaustive but a short list of those variables	Checklist	Yes	Context is a key element of the
30	Data synthesis and presentation	Data synthesis and presentation	State the type of synthesis conducted as part of the systematic review		Meta-data	Narrative and if possible, qualitative (thematic analysis)	
31		Narrative synthesis strategy	Describe methods to be used for narratively synthesising the evidence	Vote-counting (tallying of studies based on the direction or significance	Checklist	Yes	
32		Quantitative synthesis strategy	If data are appropriate for quantitative synthesis, describe planned	Compulsory if appropriate for data	Checklist	n/a	
33		Qualitative synthesis strategy	Describe methods to be used for synthesising qualitative data and justify	Compulsory if appropriate for data	Checklist	Yes	
34		Other synthesis strategies	Describe any other approaches to be used for synthesising data or	Compulsory if appropriate for data	Checklist	n/a	
35		Assessment of risk of publication	Describe planned methods for examining the possible influence of	For quantitative syntheses this may be done using diagnostic plots or	Checklist	n/a	
36		Knowledge gap identification	Describe the methods to be used to identify and/or prioritise key	Optional	Checklist	Yes	
37		Demonstrating procedural	Describe the role of systematic reviewers (who have also authored	Reviewers who have authored articles to be considered within the	Checklist	Yes	
38	Declarations	Competing interests	Describe of any financial or non-financial competing interests that the		Checklist	Yes	

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- [1] Baylis, H.R., Hoddaway, N.R., Eales, J., Frampton, G.K. and James, K.L., 2016. Updating and amending systematic reviews and systematic maps in environmental management. *Environmental Evidence*, 5(1), p.20.
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