



EVALUATION FRAMEWORKS IN ASSESSING AGROECOLOGICAL SYSTEMS TO SUPPORT TRANSITION: A SCOPING REVIEW

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OVERVIEW

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INTRODUCTION

The intensification of agriculture, driven by global population demands, has led to industrial farming practices that, while contributing to food security, result in significant challenges such as:

- Soil degradation (Oldeman, 1992)
- Public health concerns (Leighton, 2021)
- Environmental pollution (Horrigan et al., 2002)
- Others

To address these challenges, a shift towards sustainable food systems is crucial.

Agroecology (AE) emerges as a promising solution by:

- Balancing agronomic and ecological functions over maximizing productivity (Trabelsi et al., 2016).
- Agroecology seeks to optimize the interactions between plants, animals, humans and the environment while also addressing the need for socially equitable food systems (FAO).



Problem

01

Challenges in Evaluating Agroecological Transition (AET):

- Substantial methodological challenges necessitate a multidisciplinary approach and stakeholder engagement across food systems (Wezel & David, 2012).
- Evaluating AET focuses on the transformation process of systems, encompassing technical, social, and environmental dimensions.

02

Critical Principles for Facilitating AET:

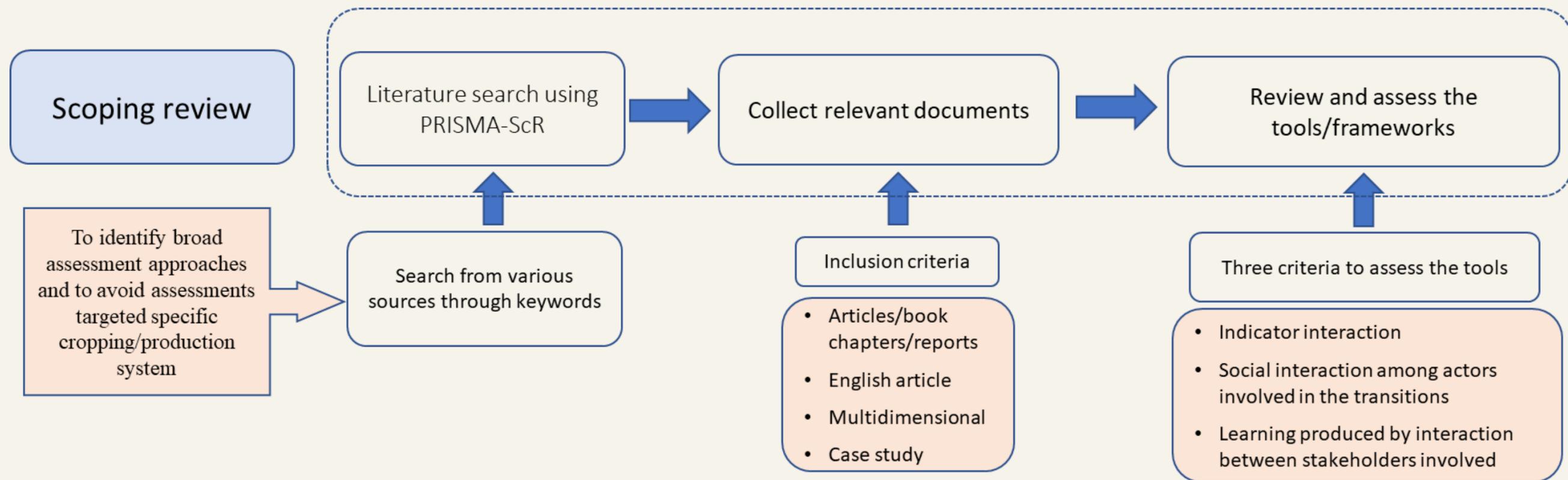
- Interaction Between Sustainability Components and Indicators:
 - Recognizes synergies and trade-offs between sustainability goals and indicators (Tittonell, 2023a; Wiget et al., 2020; Liu et al., 2022).
- Interaction Between Actors Involved in the Transition:
 - Emphasizes understanding power dynamics, roles, and stakeholder positions in the transition process (Darmaun et al., 2023; Magrini et al., 2019).
- Learning Through Stakeholder Interactions:
 - Focuses on the participatory and equitable involvement of stakeholders.
 - Enhances adoption and commitment to agroecological practices (Duru et al., 2015; Utter et al., 2021).

03

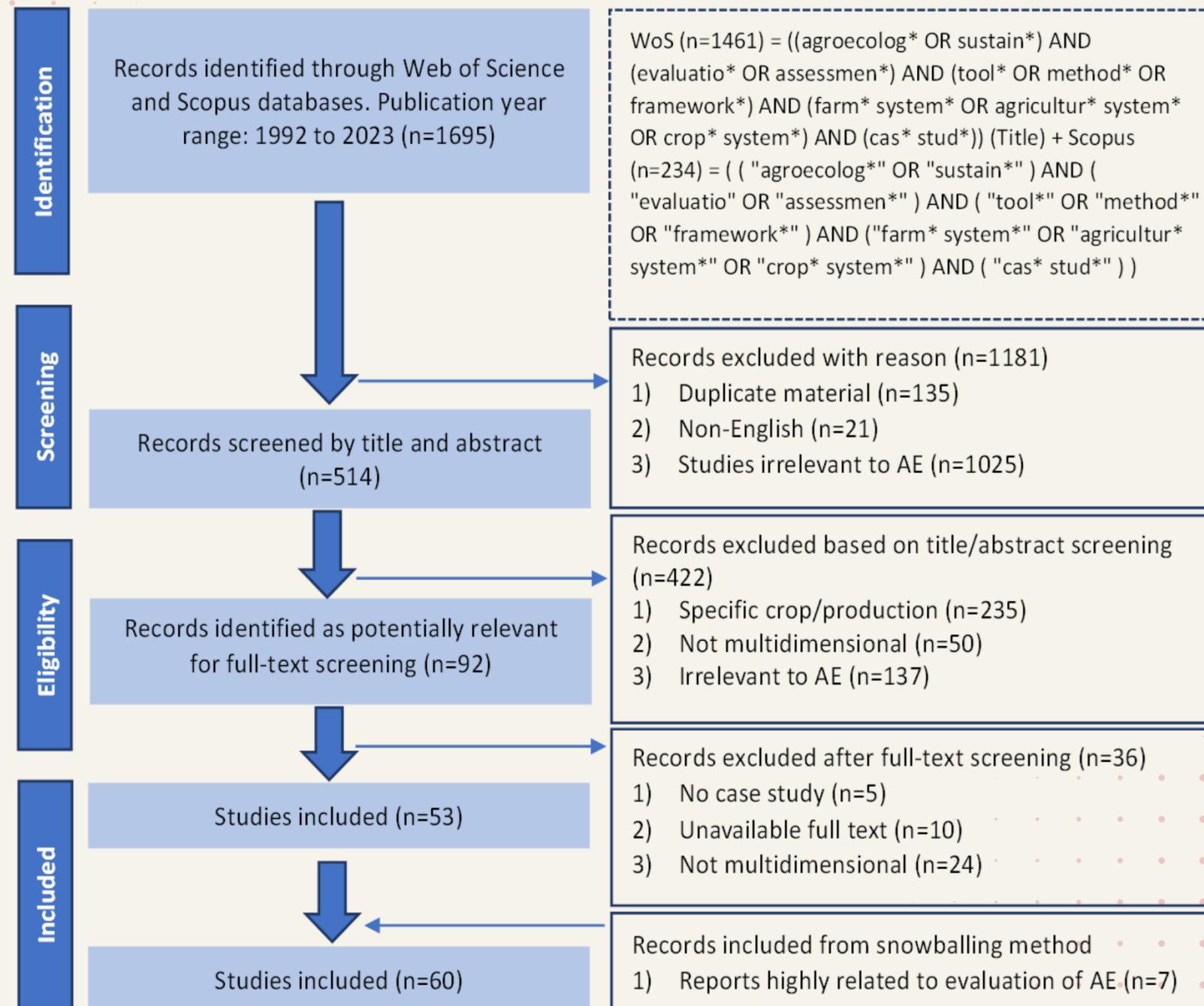
Gaps in Existing Frameworks:

- While various studies have examined sustainable agriculture assessment frameworks and agroecological performance evaluation, there is a lack of reviews addressing the three critical principles:
 - Interaction between sustainability components and indicators.
 - Interaction between stakeholders in the transition.
 - Learning facilitated through stakeholder interactions.

METHODOLOGY



RESULT



WoS (n=1461) = ((agroecolog* OR sustain*) AND (evaluatio* OR assessmen*) AND (tool* OR method* OR framework*) AND (farm* system* OR agricultur* system* OR crop* system*) AND (cas* stud*)) (Title) + Scopus (n=234) = (("agroecolog*" OR "sustain*") AND ("evaluatio" OR "assessmen*") AND ("tool*" OR "method*" OR "framework*") AND ("farm* system*" OR "agricultur* system*" OR "crop* system*") AND ("cas* stud*"))

RESULT

- **28 frameworks spanning various regions and incorporate diverse dimensions and methodologies to assess agricultural systems are collected.**
- **8 frameworks could be identified as having been specifically developed to measure AE systems:**
 - **Self-diagnosis of agroecological practices in a family farming context (Autodiag),**
 - **Integrated valuation of ecosystem services to understand and steer agroecological transitions (Dendoncker),**
 - **Evaluation and Simulation of Agroecological Systems (ESSIMAGE)**
 - **Assessment method for the economic-ecological analysis of agroecosystems (Lume)**
 - **A system for monitoring and evaluation agroecology (Memento GTAE)**
 - **Original Agroecological Survey Indicator System (OASIS)**
 - **Tool for Agroecology Performance Evaluation (TAPE)**
 - **Participatory design assessment methodology of territorial biodiversity-based agriculture (Tata-Box)**

List of Frameworks

System for weighted environmental impact assessment of rural activities (APOIA-NovoRural)	Multiscale Methodological Framework (MMF)
Self-diagnosis of agroecological practices in a family farming context (Autodiag)	Monitoring Tool for Integrated Farm Sustainability (MOTIFS)
Integrated valuation of ecosystem services to understand and steer agroecological transitions (Dendoncker)	Original Agroecological Survey Indicator System (OASIS)
Evaluation system for sustainable, regional agricultural development (ESEEP)	Public Goods tool (PG tool)
Evaluation and Simulation of Agroecological Systems (ESSIMAGE)	Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE)
Farm assessment index (FAI)	Problem-oriented Status-Driver Composite Indicator-base Framework of Agricultural Sustainability Assessment (PSDCIFASA)
Framework for evaluating sustainable land management (FESLM)	Response-inducing sustainability evaluation (RISE)
Framework of Participatory Impact Assessment for Sustainable and Resilient Farming systems (FoPIA-SURE-Farm)	Sustainable Agri-Food Evaluation Methodology (SAEMETH)
Farm Sustainability Indicators method (IDEA)	Sustainability Assessment of Food and Agriculture Systems (SAFA)
Assessment method for the economic-ecological analysis of agroecosystems (Lume)	Sustainability Assessment of Farming and the Environment (SAFE)
A system for monitoring of monitoring and evaluation agroecology (Memento GTAE)	Assessment of the resilience of socio-ecological production landscapes and seascapes (SEPLS)
Framework for the Evaluation of Management Systems using Indicators (MESMIS)	SMART-Farm Tool
Method to assess sustainability of agricultural systems (Soulé)	Social-Ecological Systems Framework for Food Systems "SES (T)"
Participatory design assessment methodology of territorial biodiversity-based agriculture (Tata-Box)	Tool for Agroecology Performance Evaluation (TAPE)

RESULT

- The analysis of interactions among sustainability indicators and components is rarely incorporated into individual assessment frameworks.
 - 10 out of 28 frameworks consider indicator interactions in their frameworks.
- 22 out of 28 frameworks have incorporated the consideration of interactions between actors involved in the transition in their analyses.
 - Most of them applied social network analysis while a few applied stakeholder mapping in their analyses.
- Seven frameworks consider producing learning by evolving interactions between stakeholders.
 - It incorporates participatory elements to engage stakeholders actively to ensure stakeholders' inputs are integral to the learning process.

No	Frameworks	Indicator interaction	Social Interaction	Learning produced by interactions
1	APOIA-NovoRural	✓		
2	Autodiag	✓	✓	
3	Dendoncker	✓	✓	✓
4	ESEEP			
5	ESSIMAGE	✓	✓	
6	FAI			
7	FESLM		✓	
8	FoPIA-SURE-Farm	✓	✓	✓
9	IDEA		✓	
10	Lume		✓	
11	Memento GTAE		✓	
12	MESMIS	✓	✓	✓
13	Soulé	✓		
14	MMF	✓	✓	✓
15	MOTIFS		✓	
16	OASIS		✓	
17	PG Tool		✓	
18	PROMETHEE		✓	
19	PSDCIFASA		✓	
20	RISE			
21	SAEMETH		✓	✓
22	SAFA		✓	
23	SAFE		✓	
24	SEPLS			
25	SMART-Farm Tool	✓	✓	
26	SES(T)		✓	
27	TAPE	✓	✓	✓
28	Tata-Box	✓	✓	✓

CONCLUSION & RECOMMENDATIONS

- The majority of the frameworks analysed in this study do not explicitly focus on evaluating agroecological systems and were not suitable or applicable to evaluate transitions based on identified principles.
- Only ten frameworks address the interactions among sustainability indicators and components, utilising either expert judgment or a participatory method.
 - It suggests that engaging stakeholders is essential for incorporating their perspectives and focusing on a limited set of variables to make quantitative analysis of these interactions feasible.
- None of the frameworks provide comprehensive mapping and analysis of stakeholder interactions and roles.
 - It is essential to integrate social mapping and social network analysis more thoroughly into the assessment frameworks.
- Only seven frameworks emphasise generating learning through evolving stakeholder interactions.
 - It highlights the importance of participatory approaches and iterative learning, fostering knowledge exchange and collaboration through the assessment.



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Q & A

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