

Sustainable Microfinance As A Transforming Knowledge Domain: A Bibliometric And Systematic Review

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Abstract: *Sustainable microfinance has evolved from an instrument to alleviate poverty into a multidimensional development tool that integrates financial inclusion, social outcomes, and environmental sustainability. However, the research in this field is fragmented across microfinance, green finance, and sustainable finance, and it unclear how these dimensions interact. We address this gap by conducting the first integrated bibliometric and systematic review of sustainable microfinance, based on articles published between 1999 and 2025 (identified in Web of Science and Scopus). We use a mixed-methods design that combines bibliometric mapping with qualitative synthesis to reconstruct the conceptual evolution of the field and identify its intellectual and thematic structure. The results reveal three stages: an initial welfarist phase focused on poverty reduction and women's empowerment; an institutionalist phase emphasising financial self-sufficiency and operational efficiency; and a recent sustainability-oriented phase that incorporates environmental responsibility, governance quality, and digital transformation. The emerging themes include climate-risk management, renewable energy financing, environmental performance of microfinance institutions, impacts based on gender, knowledge-based financial inclusion, and the role of institutional capacity in shaping development outcomes. From a development perspective, sustainable microfinance intersects with climate vulnerability, persistent inequalities, digital divides, and governance challenges. Nevertheless, there are important gaps regarding theoretical integration, cross-country comparability, how environmental and social outcomes are measured, and the long-term effectiveness of green and gender-oriented interventions. Overall, sustainable microfinance is a promising but under-theorised domain with substantial potential to support inclusive, climate-resilient, and gender-responsive development pathways. We propose a future*

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research agenda grounded in multidimensional and context-sensitive approaches.

Keywords: Sustainable Microfinance; Systematic Review; Financial Inclusion; Green Microfinance; Governance and Institutions; Digital Financial Inclusion.

JEL Classification: G21; O16; O44; Q01; Q56; O33

Introduction

Access to financial services is central to social inclusion, poverty reduction and local development. Microfinance emerged in the late 20th century as a mechanism for providing credit, savings, insurance and transfers to populations traditionally excluded from formal banking (Armendariz & Morduch, 2009). Early research legitimised microcredit as a development tool, focusing on vulnerable households, income generation and women's empowerment (Kabeer, 2003; Morduch et al., 2003; Pitt & Khandker, 1998). Yet the field has long been divided between welfarist approaches, which prioritise outreach to the poorest groups, and institutionalist approaches, which argue that MFIs can only sustain their development mission if they achieve financial self-sufficiency (Fidler & Robinson, 2001; Mitra & Vivekananda, 2013; Morduch, 1999, 2000).

Since the adoption of the 2030 Agenda and the Sustainable Development Goals (SDGs), sustainable microfinance has expanded beyond financial inclusion and institutional viability to incorporate explicit social and environmental objectives. MFIs increasingly support small-scale renewable energy, climate adaptation, sustainable agriculture and resilience-building initiatives, especially in low- and middle-income countries exposed to structural inequality and climate vulnerability (D'Espallier et al., 2017; Hermes & Hudon, 2019).

Despite this expansion, the literature remains fragmented across microfinance, green finance and sustainable finance. Prior bibliometric studies have examined these domains separately, but not their intersection in sustainable microfinance (Bhatnagar & Sharma, 2022; Bhatnagar et al., 2021; Debrah et al., 2023; Gutiérrez-Nieto & Serrano-Cinca, 2019; Wang & Xu, 2025; Zhang et al., 2019). To address this gap, we conduct an integrated bibliometric and systematic review of 51 articles published between 1999 and 2025 in Web of Science and Scopus, guided by the research questions in Table 1.

The paper makes three contributions. First, it provides the first integrated bibliometric and systematic review of sustainable microfinance. Second, it clarifies the field's conceptual evolution, from early debates on financial self-sufficiency to broader social and environmental objectives aligned with the SDGs. Third, it maps the thematic streams and intellectual clusters that structure the field and identifies future opportunities relating to climate adaptation, inequality, digital transformation and the governance of inclusive financial systems.

Table 1: Research questions, objectives, and motivation.

Question	Objective	Motivation
1: How has research in the field of sustainable microfinance evolved?	To analyse the temporal evolution of the literature on sustainable microfinance, identifying its stages of development, consolidation, and thematic diversification	To understand how the field has matured from the initial emphasis on microcredit and poverty towards broader debates that integrate environmental sustainability, resilience, and governance
2: What are the key journals, articles, and leading authors in this field?	To identify the main publication channels, the most influential articles, and the leading authors in sustainable microfinance	To enable researchers and practitioners to quickly locate the most relevant sources and to understand the dynamics of academic and institutional leadership in the field
3: What are the main research trends in the literature on sustainable microfinance?	To map the thematic clusters and conceptual streams that structure sustainable microfinance	To offer an integrated view of a fragmented field, showing how researchers have framed debates on social inclusion, environmental sustainability, financial performance, governance, and regulation
4: What are the main research fronts and future opportunities in this field?	To identify gaps and emerging lines of research that will guide future academic agendas	To connect sustainable microfinance with global challenges such as climate change, the energy transition, financial digitalisation, and the Sustainable Development Goals

Theoretical framework

2.1. From microfinance to sustainable microfinance

Microfinance emerged in the 1970s as an instrument to expand financial access to populations excluded from formal banking. The Grameen School, pioneered by Muhammad Yunus through the creation of the Grameen Bank in 1976, promoted collateral-free lending to rural women in Bangladesh as a pathway to self-employment, poverty reduction and empowerment; Yunus and the Grameen Bank received the 2006 Nobel Peace Prize for this work. This welfarist orientation influenced early research on household welfare, gender dynamics and social inclusion (Kabeer, 2003; Noponen, 2003). Over time, the institutionalist or Ohio School recast microfinance as part of the broader financial system, emphasising institutional sustainability, market efficiency and reduced dependence on subsidies (Fidler & Robinson, 2001; Otero et al., 1994; Rhyne, 1998). The tension between social outreach and financial self-sufficiency continues to underpin the field (Gutiérrez-Nieto & Serrano-Cinca, 2019), alongside work on information asymmetries, peer selection, group lending and market design (Gutiérrez-Nieto & Serrano-Cinca, 2019; Schreiner, 2000).

In parallel, green and sustainable finance have transformed the context in which microfinance operates. Green finance is rooted in ecological economics and the green economy paradigm (Pearce et al., 2013), and refers to financing activities that generate environmental benefits such as renewable energy, energy efficiency, green transport and environmental protection (European Investment Bank & Green Finance Committee of China Society for Finance and Banking, 2017; G20 Green Finance Study Group, 2016). Sustainable finance is broader, integrating environmental, social and governance concerns, although the boundaries between green, climate, environmental and sustainable finance remain fluid (Ayaz & Zahid, 2024; Bhatnagar & Sharma, 2022; Singhania et al., 2024; United Nations Environmental Programme, 2021).

Alongside these shifts in conceptualisation, sustainable microfinance has gradually expanded beyond traditional financial inclusion. While early studies centred on welfarist objectives (Kabeer, 2003; Noponen, 2003), researchers later incorporated institutional sustainability concerns such as cost recovery, financial self-sufficiency (Schreiner, 2000), and managerial capacity (Battilana & Dorado, 2010). By the mid-2010s, the concept had broadened to encompass social and environmental dimensions. After the 2015 Paris Agreement and the adoption of the SDGs – with a greater focus on climate resilience, gender equality, and ecological protection as priorities for development finance – researchers began to examine environmental risk management, green lending, and climate-related vulnerabilities (Allet & Hudon, 2015; Forcella & Hudon, 2016). In summary, sustainable microfinance has evolved from a welfare tool focused on poverty reduction into a multidimensional development instrument that integrates financial viability, social inclusion, and environmental sustainability within the global SDG agenda.

2.2. The dimensions of sustainable microfinance

Traditionally, three main dimensions have shaped the field of sustainable microfinance: financial, social, and environmental. The financial dimension deals with the capacity of MFIs to achieve financial viability, to reduce dependency on subsidies, and to ensure stable long-term service provision to excluded populations. There has been extensive analysis of institutional sustainability in the context of efficiency, profitability, and operational resilience (Battilana & Dorado, 2010; Gutiérrez-Nieto & Serrano-Cinca, 2019; Schreiner, 2000). In development contexts, financial sustainability is seen as essential to guarantee stable access to credit for vulnerable groups. The social dimension is rooted in the welfarist perspective. It highlights how microfinance contributes to poverty reduction, gender empowerment, income stability, and the inclusion of marginalised groups. Microcredit can enhance household resilience, strengthen women's decision-making, and support informal entrepreneurship (Kabeer, 2003; Noponen, 2003). This dimension aligns microfinance with development outcomes such as equity, human capabilities, and inclusive growth. Finally, environmental sustainability has become increasingly important due to the issue of climate change. This dimension links microfinance to broader debates on climate justice, resource vulnerability, and low-carbon development pathways, all of which disproportionately affect poor and rural populations. Green microfinance promotes renewable energy solutions, climate adaptation strategies, sustainable agriculture, and the ability to build resilience among vulnerable communities. Although it is beneficial to integrate environmental objectives into MFI

operations, there are challenges that must be overcome (Allet & Hudon, 2015; D'Espallier et al., 2017; Forcella & Hudon, 2016).

There are also two emerging cross-cutting dimensions. The governance dimension is related to institutional accountability, regulation, and ethical management aligned with sustainability goals (Ahmad & Satrovic, 2024; Halouani, 2025; Lam et al., 2020), while the technological dimension addresses digital financial inclusion and information management as drivers of efficiency, transparency, and innovation (C. W. Lee & Huruta, 2022; Zhao et al., 2025). Taken together, the traditional and emerging dimensions reflect the complexity and richness of sustainable microfinance, as well as the persistent challenge of reconciling financial viability, social inclusion, and environmental resilience, particularly in the development contexts where microfinance operates.

2.3. Dilemmas and tensions in the literature

As mentioned, the evolution of the sustainable microfinance field has been characterised by challenges that continue to shape both practice and research.

The first challenge concerns the balance between financial sustainability and social inclusion. While MFIs must ensure operational efficiency and financial viability, their original development mission requires that access for the poorest and most vulnerable populations – who typically face higher risks and generate lower financial returns – must be maintained. This trade-off has fuelled the longstanding debate on mission drift (Cull et al., 2009; Hudon & Traca, 2011): MFIs may gradually shift from poverty-oriented objectives towards more commercially driven strategies (Battilana & Dorado, 2010; Schreiner, 2000). This dilemma is central to debates on targeting, equity, and the unintended consequences of market-based poverty interventions.

A second challenge arises from the growing effort to incorporate environmental sustainability into microfinance. Green microfinance initiatives include support for renewable energy, sustainable agricultural practices, and/or climate adaptation, and have the potential to reduce vulnerability and to promote resilience among low-income communities. However, these projects often require a high initial investment, more extensive risk assessments, and a longer time frame compared with projects funded by traditional microcredit (Allet & Hudon, 2015; Forcella & Hudon, 2016). These issues have led to concerns about whether MFIs have the capacity, incentives, or financial space to internalise environmental objectives. Moreover, climate vulnerability disproportionately affects microfinance clients (Beisland et al., 2023; Dorfleitner et al., 2020), so it can be difficult to align financial, environmental, and social goals. A third challenge relates to governance structures, which must mediate competing objectives to ensure accountability, transparency, and alignment with long-term development outcomes. Governance is particularly relevant when there is weak or fragmented regulation, and where MFIs must operate across diverse institutional environments (Ahmad & Satrovic, 2024; Halouani, 2025). This challenge also intersects with development discussions on institutional quality, decentralisation, and state capacity.

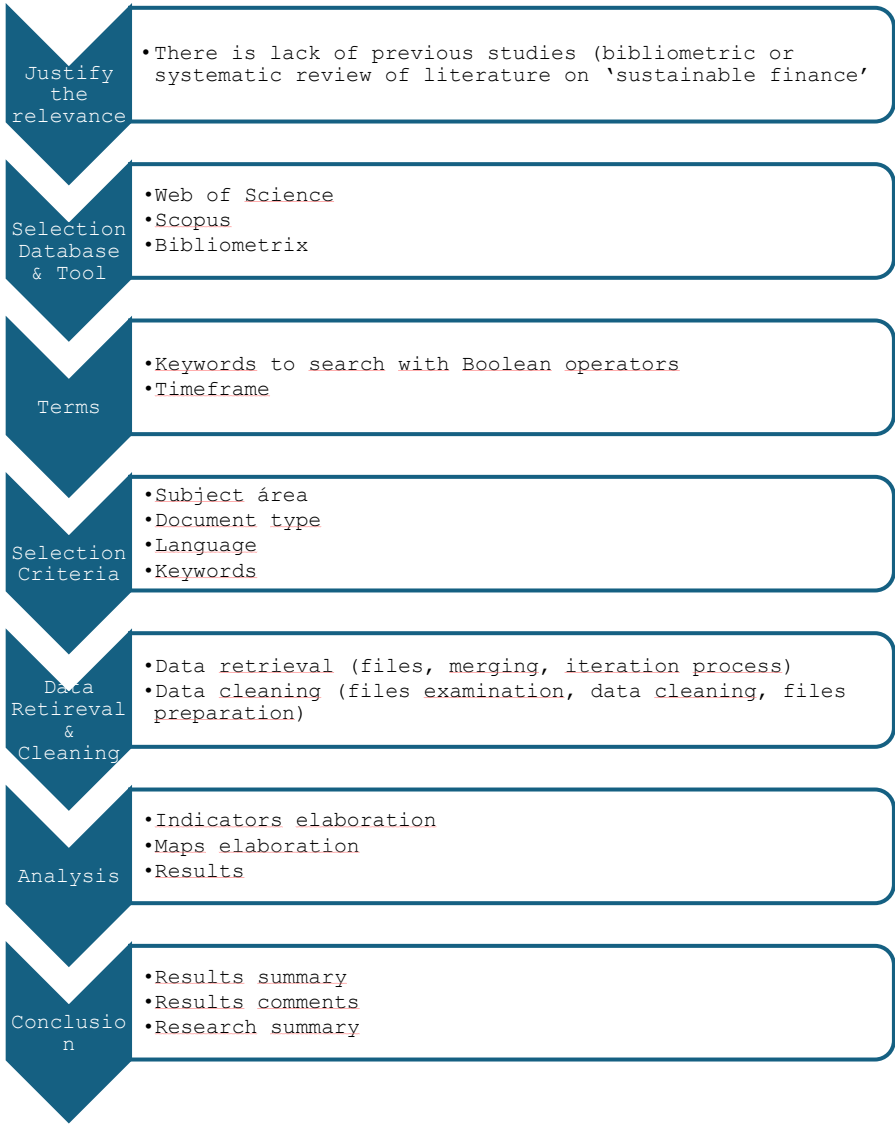
Finally, digitalisation has a major role in reshaping microfinance systems, although it also introduces new issues. Mobile banking, digital credit scoring, fintech platforms, and data-driven risk assessment, among other digital tools, can reduce transaction costs, expand outreach, and improve client profiling. However, there are risks related to exclusion, data privacy, and algorithmic bias (Lam et al., 2020; C. W. Lee & Huruta, 2022; Zhao et al., 2025), particularly when digital access is unequal. Hence, there is tension between innovation-led efficiency and inclusive development.

Together, these dilemmas have contributed to the highly fragmented nature of the sustainable microfinance field, which spans finance, development economics, sustainability studies, and governance research (Hermes & Hudon, 2019; Wang & Xu, 2025). As prior studies tend to examine financial, social, environmental, or technological dimensions in isolation, the literature lacks a unified perspective capable of integrating these components into a coherent development framework. This fragmented knowledge base requires an integrated framework that organises the dimensions of sustainable microfinance into a unified structure (D'Espallier et al., 2017; Zhao et al., 2025).

Methodology

We performed a mixed-methods review combining bibliometric analysis and qualitative systematic synthesis (Debrah et al., 2023). The systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021), while the bibliometric analysis was conducted using the bibliometrix package in R version 4.5.0 and Biblioshiny (Aria & Cuccurullo, 2017). We adapted the search process described by Danvila-del-Valle et al. (2019). Fig. 1 summarises the five stages followed in the study.

Figure 1. Methodology



Source: Authors, based on Danvila-del-Valle et al. (2019)

3.1. Stage 1: justification of the relevance

Before commencing the review, we checked whether any bibliometric or systematic review on 'sustainable microfinance' or 'green microfinance' already existed in Scopus or Web of Science, combining these terms with 'systematic literature review' and 'bibliometric analysis'. No prior review was identified, which justified the present study.

3.2. Stage 2: selection of the databases

We searched Scopus and the Web of Science Core Collection because of their coverage of high-quality and emerging publications (Falagas et al., 2008; Marino-Romero et al., 2024). In Web of Science, we used SCI-EXPANDED, SSCI and ESCI.

3.3. Stage 3: search strategy

The search strategy was developed iteratively. First, we searched for microfinance, sustainability and sustainable microfinance in both databases. We then added related terms identified in the literature, including green finance, sustainable finance, microcredit, social impact, responsible finance, climate change and renewable energy (Akomea-Frimpong et al., 2022; Ayaz & Zahid, 2024; Bhatnagar & Sharma, 2022; Hafner et al., 2020; Kumar Verma et al., 2022; Pattnaik & Hassan, 2025; Tao et al., 2022; Zhang et al., 2019). Table 2 reports the results.

These preliminary searches also informed the periodisation. Although the Brundtland report appeared in 1987 and sustainable finance emerged in the 1990s, the first relevant published journal article on sustainable microfinance appeared in 1999. We therefore analyse the period from 1999 to 24 May 2025 and divide it into three stages that reflect the pre-SDG period, the Paris Agreement/SDG transition and the most recent phase.

- 1999–2014 → early studies;
- 2015-2019 → studies on the impact of the Paris Agreement;
- 2020–2025 → recent studies.

Table 2: The results of searching Scopus and Web of Science with different terms.

Term	Scopus			Web of Science		
	First paper	Second paper	Number of papers	First paper	Second paper	Number of papers
Sustainable microfinance	1996	1999	35	2001	2011	9
Sustainable micro-finance	1998	2000	4			
Sustainable microcredit	2011	2015	3	2015		1
Sustainable micro-credit	2023		1			
Sustainable microlend*	2004		1			
Green microfinance	2011	2012	28	2011	2015	15
Green micro-finance	2012		1			
Green microcredit	2014	2015	3	2015	2015	2
Green micro-credit	2021		1			
Social microcredit	2014	2020	2			
Social microlend*	2015	2017	2	2017		1
CSR microfinance	2013		1			

Governance microlend*	2010		1		
Inclusive microfinance	2012	2014	7	2024	1
Inclusive microcredit	2014		1		
Microfinancial inclusion	2022		1		
Responsible microfinance	2017		2	2017	1
Impact microfinance AND NOT economic impact	2014	2017	8		
Social impact of microfinance	2023		1	2013	1
Social impact of microcredit				2020	1
Climate change microfinanc*	2025		1		
Renewable energy microfinanc*	2023		1		

Abbreviation: CSR, corporate social responsibility.

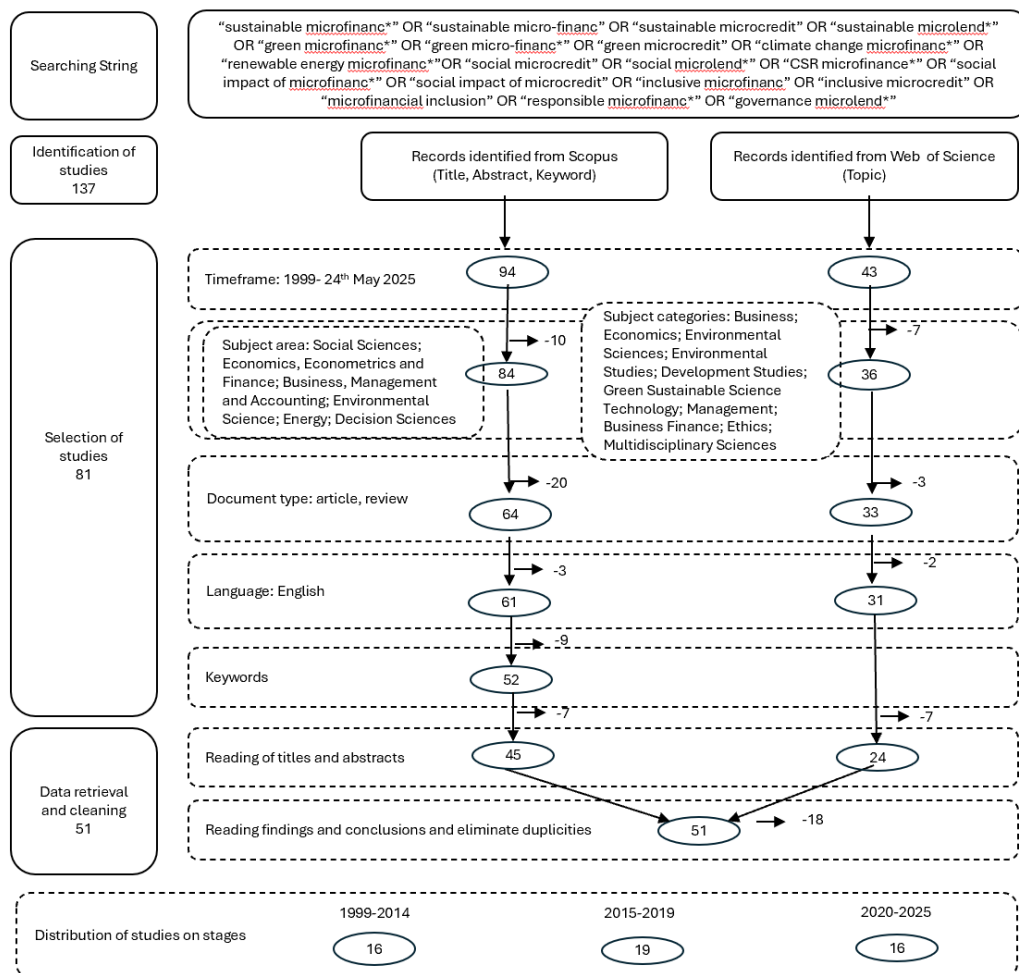
3.4. Stage 4: selection criteria

We searched titles, abstracts and keywords, and retained only English-language articles in the subject areas indicated in Fig. 2.

3.5. Stage 5: data retrieval and cleaning

The initial search yielded 94 articles from Scopus and 43 from Web of Science. After merging both datasets, removing duplicates, excluding one retracted article and applying the screening criteria shown in Fig. 2, the final sample comprised 51 articles, which were then assigned to the three stages used in the bibliometric analysis and systematic review.

Figure 2: Applied selection process



Notes: This diagram summarizes the identification, screening, eligibility assessment, and final selection of articles included in the systematic review, following PRISMA guidelines.

4. Bibliometric analysis

Table 3 shows the descriptive statistics for our systematic search. We included 51 articles published in 41 sources, with a total of 120 authors. There was an average of 13 citations per article.

Table 3 : Descriptive statistics of the included articles.

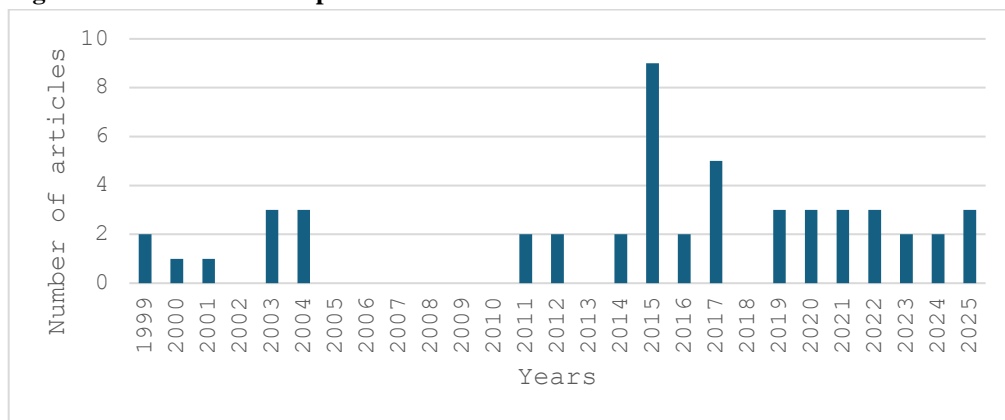
Description	Result
Timespan	1999–2025
Number of sources	41
Number of articles	51
Annual growth rate, %	1.57
Average age of the article, years	10.1

Average number of citations per article	13.31
Number of Keywords Plus	139
Number of author keywords	153
Number of authors	120
Number of articles with a single author	11
Number of articles with more than one author	40
Average number of authors per article	2.67
Percentage of articles with international co-authorships	23.53

4.1. Number of articles

Fig. 3 shows the annual production of the 51 articles from 1999 to May 2025. The first stage (1999–2014) contains 16 articles and shows low, irregular production. Output increased around 2015, coinciding with the SDGs, and the second stage (2015–2019) contains 19 articles. In the third stage (2020–2025), production stabilised at around two or three articles per year, indicating consolidation despite a still limited volume.

Figure 3. Annual scientific production



Notes: This figure shows the number of publications per year on sustainable microfinance, highlighting early low-intensity production, a marked increase after 2015, and consolidation between 2020 and 2025.

Table 4 ranks the articles by citations in Web of Science and Scopus. The most cited contributions are Patten et al. (2001), Allet and Hudon (2015) and Randøy et al. (2015), followed by Atahau et al. (2021), Forcella and Hudon (2016) and Chowdhury et al. (2004). These papers respectively address MFI resilience, environmental management, financial self-sufficiency, renewable energy and women’s empowerment, environmental performance and welfare impacts. A second group includes Lam et al. (2020), Shammi et al. (2017), Riggins and Weber (2017), Schreiner (2000), Matul and Tsilikounas (2004) and Guermond et al. (2025). Overall, citations are concentrated in a small number of papers, while many recent articles have low or no citations, confirming that the field remains fragmented and emerging.

This citation pattern indicates that sustainable microfinance has not yet reached the consolidation typical of mature research areas, although recent studies may gain visibility in the coming years.

Table 4: Ranking of the articles on sustainable microfinance based on the number of citations.

Articles	Total citations
Patten et al. (2001)	63
Allet & Hudon (2015)	59
Randøy et al. (2015)	52
Atahau et al. (2021)	32
Forcella & Hudon (2016)	30
Chowdhury et al. (2004)	27
Lam et al. (2020)	25
Shammi et al. (2017)	24
Riggins & Weber (2017)	22
Guermond et al. (2025)	20
Schreiner (2000)	20
Matul & Tsilikounas (2004)	20
Eversole (2003)	19
Nugroho et al. (2017)	19
Huybrechs et al. (2019)	18
Gulli & Berger (1999)	16
Rahman et al. (2015)	15
Rosengard (2004)	15
Kabeer (2003)	14
Rouf (2012)	14
Archer & Jones-Christensen (2011)	13
McGuire (1999)	13
C. W. Lee & Huruta (2022)	12
Shahidullah & Haque (2015)	12
Moser & Gonzalez (2016)	11
Shahidullah & Emdad Haque (2014)	10
Knewtson & Qi (2019)	10
Moser & Gonzalez (2015)	9
J. H. Lee et al. (2015)	7
Astawa et al. (2021)	7
Noponen (2003)	6
Durango et al. (2022)	5
Gonzalez & Moser (2015)	5

Beisland et al. (2023)	5
Dorfleitner et al. (2020)	5
Bastiaensen et al. (2015)	4
Mahboubi & Fortes (2015)	4
Ngong et al. (2022)	4
Nuruzzaman et al. (2024)	3
Ahmed & Tinne (2017)	3
Gatto (2023)	2
Ayayi (2014)	2
Leite & Sá (2024)	1
Saleem et al. (2011)	1
Rifai et al. (2019)	1
Chen et al. (2025)	0
Pei (2024)	0
Hamdani & Ibenrissoul (2017)	0
Nangpiire & Inanga (2012)	0
Temesgen (2021)	0
Dodaro & Bifulco (2020)	0

4.2. Authors

The 51 articles involve 120 authors. As shown in Tables 5 and 6, only a few authors have repeated contributions: Forcella, González and Moser each have three articles, while Bastiaensen, Haque, Hudon, Huruta, Huybrechs, Mersland, Rahman, Shahidullah and Van have two. The dominance analysis identifies Rosengard, Shahidullah and Moser as the most dominant authors.

Fig. 4 confirms this fragmentation by showing small collaboration clusters rather than a cohesive network. Cross-country collaborations include Indonesia–China, China–Bangladesh and Italy–Brazil, but most contributions remain relatively isolated.

Table 5: Ranking of authors by the number of articles on sustainable microfinance

Author	Number of articles
D. Forcella	3
L. González	3
R. Moser	3
J. Bastiaensen	2
C. Haque	2
M. Hudon	2
A. Huruta	2
F. Huybrechs	2
R. Mersland	2

M. Rahman	2
A. Shahidullah	2
H. G. Van	2

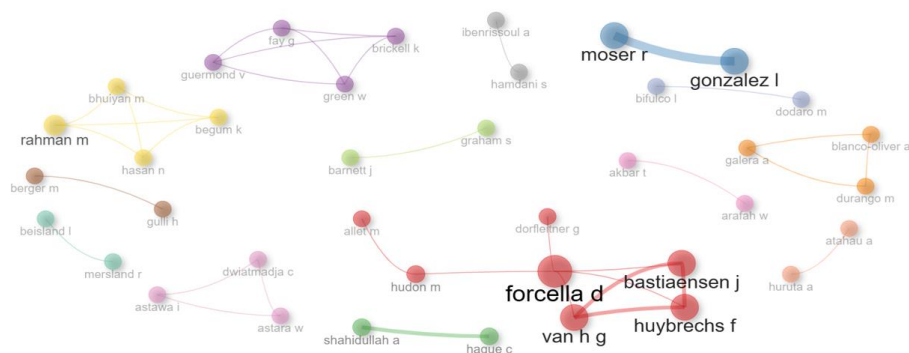
Table 6: Ranking of authors in the sustainable microfinance field by dominance

Rank	Author	TA	LA	SA	CA	Dominance
1	J. Rosengard	2	1	1	1	1
2	A. Shahidullah	2	2	0	2	1
3	R. Moser	3	2	0	3	0.67
4	J. Bastiaensen	2	1	0	2	0.50
5	M. Rahman	2	1	0	2	0.50
6	F. Huybrechs	2	1	0	2	0.50
7	D. Forcella	3	1	0	3	0.33
8	L. Gonzalez	3	1	0	3	0.33

Abbreviations: TA, total number of articles; LA, total number of first-authored articles; SA, total number of sole-authored articles; CA, total number of co-authored articles. Dominance is calculated as CA/LA.

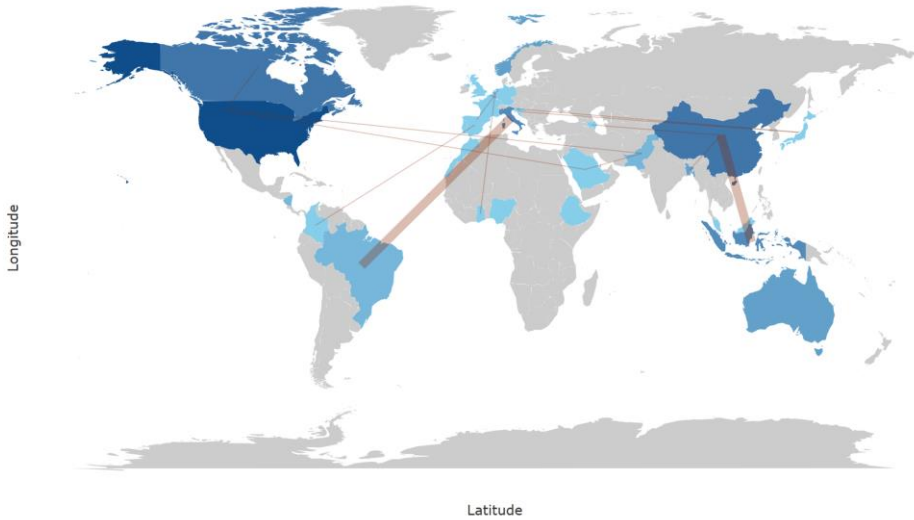
Figure 4. Authors and countries' collaboration network

Panel A: Author's collaboration network



Note: The bigger the colored spot, the higher the number of articles published for this author. The thicker the line, the wider the collaboration between authors.

Panel B: Countries' collaboration network



Note: The darker the region colored in blue, the higher the number of articles published in that region.

4.3. Journals

Table 7 shows that the 51 articles were published in 41 journals. The Journal of International Development is the leading outlet, with five articles, followed by Enterprise Development and Microfinance, with three; the remaining sources show limited concentration.

Table 7: Ranking of journals by the number of articles on sustainable microfinance.

Journal	Number of articles
<i>Journal of International Development</i>	5
<i>Enterprise Development and Microfinance</i>	3
<i>IDS Bulletin</i>	2
<i>Journal of Business Ethics</i>	2
<i>RAE – Revista de Administracao de Empresas</i>	2
<i>Sustainability</i>	2
<i>African Journal of Accounting Auditing and Finance</i>	1
<i>Antipode</i>	1
<i>Applied Economics</i>	1
<i>Asian Business & Management</i>	1
<i>Climate Policy</i>	1
<i>Credit and Capital Markets</i>	1
<i>Current Opinion in Environmental Sustainability</i>	1
<i>Discover Sustainability</i>	1
<i>Entrepreneurship Theory and Practice</i>	1
<i>Environment Systems and Decisions</i>	1
<i>European Journal of Economics, Finance and Administrative Sciences</i>	1

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<i>European Journal of Sustainable Development</i>	1
<i>Humanomics</i>	1
<i>Information Technology for Development</i>	1
<i>International Journal of Bank Marketing</i>	1
<i>International Journal of Economic Perspectives</i>	1
<i>International Journal of Energy Economics and Policy</i>	1
<i>International Journal of Environment and Sustainable Development</i>	1
<i>International Journal of Green Economics</i>	1
<i>International Journal of Sociology and Social Policy</i>	1
<i>Journal of Cleaner Production</i>	1
<i>Journal of Economic and Administrative Sciences</i>	1
<i>Journal of Risk Finance</i>	1
<i>Journal of Sustainability Science and Management</i>	1
<i>Mondes en Developpement</i>	1
<i>Nonprofit and Voluntary Sector Quarterly</i>	1
<i>PLOS One</i>	1
<i>Public Performance and Management Review</i>	1
<i>Quality – Access To Success</i>	1
<i>Revista de Administracao Publica</i>	1
<i>Savings and Development</i>	1
<i>Small Enterprise Development</i>	1
<i>South Asian Journal of Business and Management Cases</i>	1
<i>Technological and Economic Development of Economy</i>	1
<i>World Development</i>	1

4.4. Affiliations and countries

The articles are authored by researchers from 67 institutions in 31 countries. As shown in Table 8, the Federal Urdu University of Arts and the University of Agder are the most represented affiliations.

Geographically, North America and Asia are the most prolific regions (Figs. 4B and 5), with the United States, China and Indonesia leading. The prominence of Indonesia, Bangladesh and Pakistan is consistent with the historical importance of these countries in microcredit research.

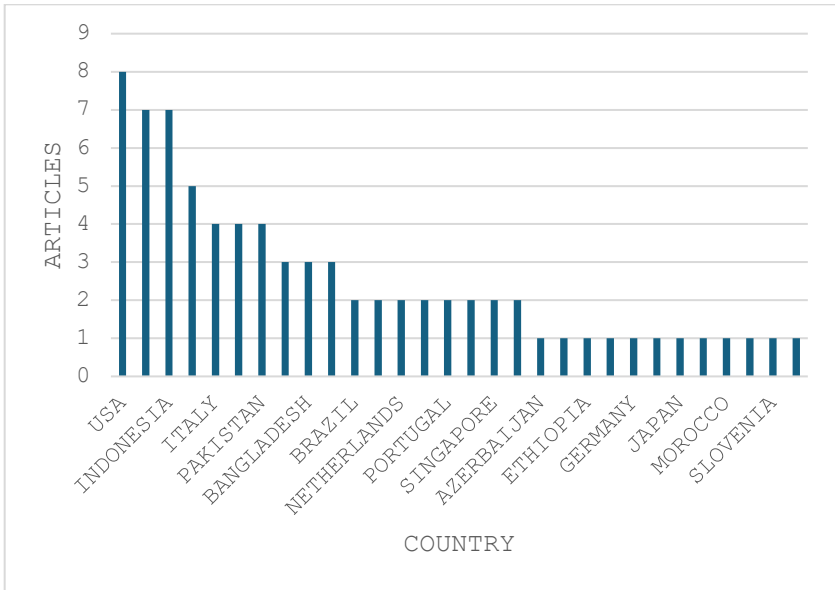
Table 8

Ranking affiliations by the number of articles on sustainable microfinance.

Affiliation	Number of articles	Proportion of authorship (%)
Federal Urdu University of Arts	4	4.3
University of Agder	4	4.3
Chung Yuan Christian University	3	3.2
Jahangirnagar University	3	3.2
National University of Singapore	3	3.2
Sher-E-Bangla Agricultural University	3	3.2
Universitas Kristen Satya Wacana	3	3.2
Universite Libre de Bruxelles	3	3.2
Getulio Vargas Foundation	2	2.1
Harvard University	2	2.1
King's College London	2	2.1
Northwest A&F University – China	2	2.1
Universidade do Minho	2	2.1
University Ha'il	2	2.1
University of London	2	2.1
University of Regensburg	2	2.1
University of Trento	2	2.1

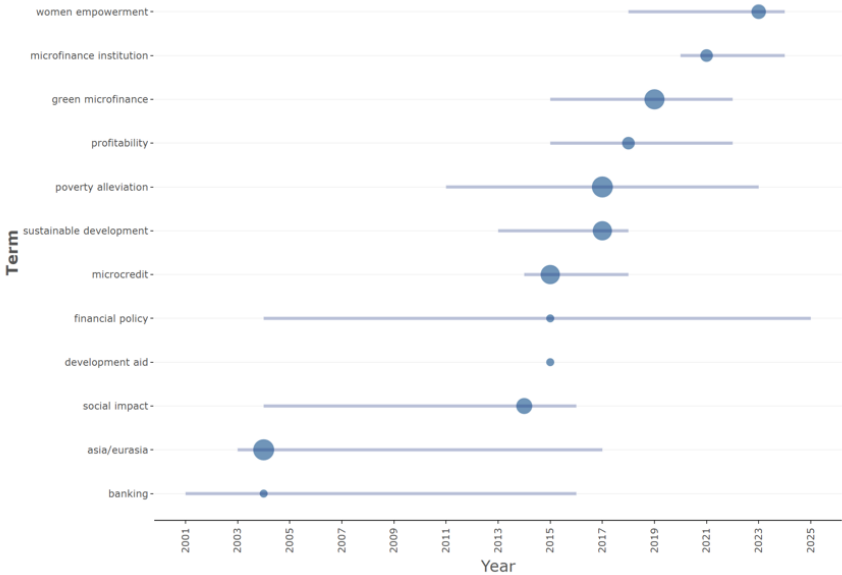
Note: this table only includes affiliations associated with more than one article.

Figure 5. Country-wise distribution on sustainable microfinance (1999-2025).



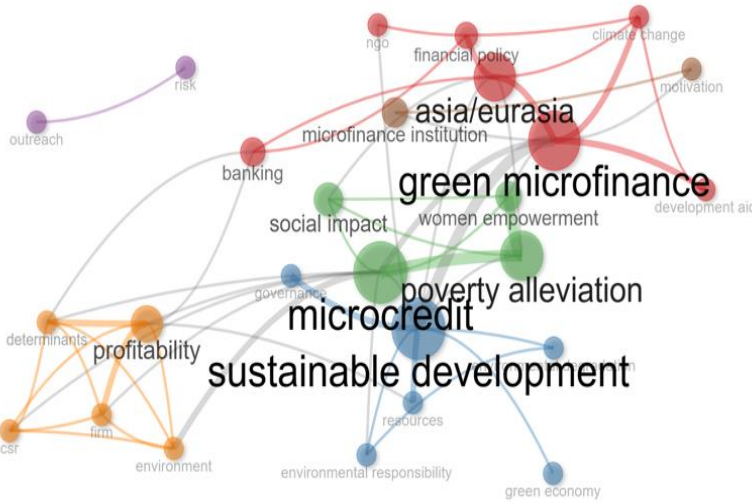
Notes: This map shows the geographic distribution of scientific output, highlighting countries with the highest number of contributions to sustainable microfinance research.

Figure 7. Trend topic



Note: This visualization shows the temporal evolution of key topics in sustainable microfinance.

Figure 8. Co-occurrence network:

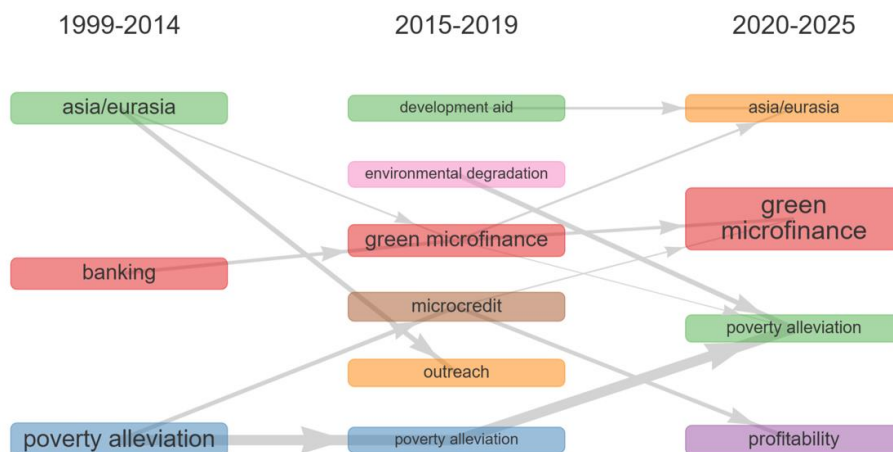


Note: The figure maps conceptual relationships between the most frequent keywords.

4.6. Thematic mapping of evolution in sustainable microfinance

Fig. 9 traces the evolution of keywords across the three stages. Early work focused on poverty alleviation and specific geographical areas. After 2015, green microfinance, outreach and profitability gained visibility, while social themes continued throughout the period.

Figure 9. Thematic evolution into the three stages



Note: This Sankey diagram traces how research themes evolved from the early foundations of microfinance toward more recent integration of environmental sustainability, governance, and digital inclusion.

We then examined thematic development through centrality and density (Fig. 10), distinguishing motor, niche, emerging and promising themes.

In the first stage (1999–2014), themes are mainly social, with clusters around Asia/Eurasia, poverty alleviation, banking, microenterprise and entrepreneurship. The motor themes concern social impact and geographical contexts, while poverty alleviation appears as a promising theme.

In the second stage (2015–2019), motor themes shift towards the environmental dimension, especially green microfinance, sustainable development and environmental responsibility. Niche themes also relate to environmental degradation and resources, while outreach and social impact remain promising.

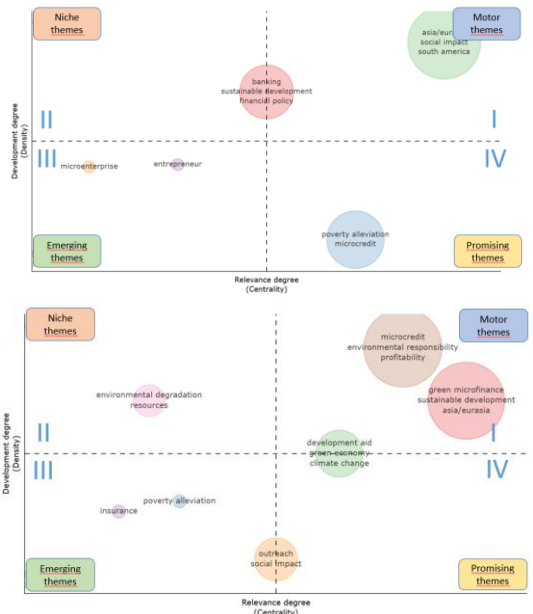
In the third stage (2020–2025), green microfinance and MFIs become motor themes. Women’s empowerment and poverty alleviation remain relevant, financial inclusion emerges, and governance, profitability and financial risk appear as promising themes.

For the entire period, the map confirms that sustainable microfinance is organised around green microfinance, microcredit, poverty alleviation, social impact, women’s empowerment, governance and profitability, while climate change, renewable energy and vulnerability remain more specialised or emerging topics.

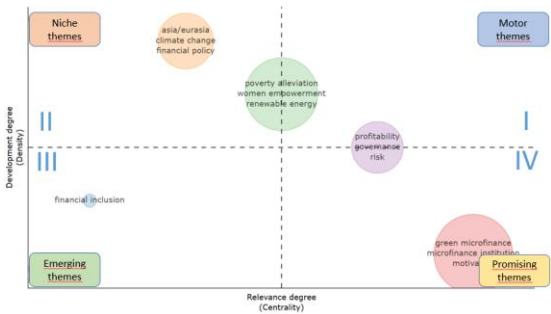
Figure 10. Thematic evolution base on the co-occurrences of keywords in sustainable microfinance (1999-2025):

Panel A. 1999-2014

Panel B. 2015-2019



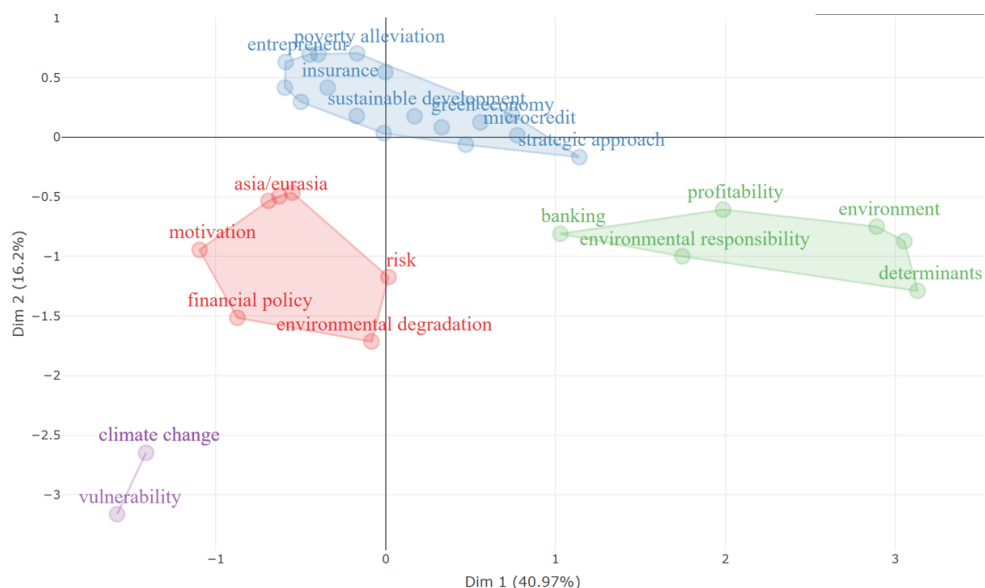
Panel C. 2020-2025



Note: These figures show the main themes according to centrality and density.

The multiple correspondence analysis (Fig. 11) identifies the latent structure of the field. Dim 1 explains 40.97% of the variance and captures a shift from socially oriented studies to financially and environmentally integrated approaches. The map separates a welfarist cluster, an institutionalist cluster, a financial-environmental cluster and an emerging climate-vulnerability cluster, confirming the progressive movement towards a sustainability-oriented paradigm.

Figure 11. Factorial analysis (multiple correspondence analysis)



Note: This figure presents the multidimensional scaling of keywords, revealing two main conceptual domains: one centered on financial inclusion and social development, and another on environmental sustainability and green microfinance.

Systematic review

5.1. The first stage (1999–2014)

Most studies from the first stage are qualitative and descriptive, examining specific case-based experiences that are geographically and thematically dispersed: Bangladesh (Rouf, 2012; Shahidullah & Emdad Haque, 2014), Indonesia (Patten et al., 2001; Rosengard, 2004), India (Noponen, 2003), several South and Southeast Asian countries (Archer & Jones-Christensen, 2011; McGuire, 1999), China (Rahman et al., 2015), Bosnia and Herzegovina (Matul & Tsilikounas, 2004), Bolivia (Chowdhury et al., 2004; Eversole, 2003), and Canada (Rouf, 2012). This research primarily addresses poverty alleviation, empowerment, and emerging environmental practices.

Early case studies highlight fundamental institutional and policy challenges. Patten et al. (2001) analyse the performance of Bank Rakyat Indonesia during the East Asian crisis, while McGuire (1999) identifies policy and regulatory conditions that enable sustainable microfinance in nine Asian countries. Eversole (2003) stresses that MFI growth does not automatically translate into entrepreneurial benefits.

Social development perspectives dominate this stage. The Imp-Act framework emphasises broader social impacts and shifts in community power structures (Kabeer, 2003). In India, Noponen (2003) shows that internal learning systems can strengthen women's empowerment

and participation in household and community decision-making. Matul and Tsilikounas (2004) document how microcredit supported post-conflict household reconstruction in Bosnia and Herzegovina, while Chowdhury et al. (2004) evaluate welfare impacts in Bolivia, Indonesia, and Bangladesh, stressing the ongoing role of donors.

A parallel debate concerns financial sustainability. Schreiner (2000) introduces one of the first formal definitions of sustainability: 'the ability to repeat performance through time'. It highlights the trade-offs between donor funding and long-term viability. These debates laid the conceptual foundation for the institutionalist perspective later developed by Battilana and Dorado (2010), who argue that entrepreneur–chief executive officers (CEOs) can better balance efficiency and social mission. Rosengard (2004) further frames microfinance as a form of social entrepreneurship capable of generating both private and social value.

Environmental issues appear less frequently. Based on their evaluation, Shahidullah and Emdad Haque (2014) find that rural microenterprises in Bangladesh have substantial long-term ecological benefits. A comparison of green microfinance in Bangladesh and Canada reveals the potential for self-sustaining renewable-energy models (Rouf, 2012). According to their classification of green microfinance initiatives in Asia, Archer and Jones-Christensen (2011) find that only a small fraction of MFIs incorporate explicit environmental strategies.

Overall, the articles from stage 1 establish the conceptual foundations of sustainable microfinance, characterised by qualitative evidence on poverty alleviation, empowerment, early regulatory debates, and the first experiments linking microfinance with environmental sustainability. These discussions set the stage for the broader multidimensional expansion that has occurred since the Paris Agreement in 2015.

5.2. The second stage (2015–2019)

While sustainable microfinance research remains largely qualitative during this stage, it becomes more thematically diverse. Scholars begin to integrate environmental and institutional concerns alongside traditional social goals. This work focuses on countries throughout the world, including Bangladesh (J. H. Lee et al., 2015; Shahidullah & Haque, 2015; Shammi et al., 2017), Indonesia (Nugroho et al., 2017), China (Rahman et al., 2015), Brazil (Gonzalez & Moser, 2015; Moser & Gonzalez, 2015, 2016), Nicaragua (Bastiaensen et al., 2015), and Europe (Forcella & Hudon, 2016).

Green microfinance is a major theme in these studies. In Bangladesh, Shammi et al. (2017) highlight regulatory gaps in pesticide use, while Shahidullah and Haque (2015) show that integrating ecological elements into microcredit improves environmental outcomes. In Brazil, Moser and Gonzalez (2015, 2016) demonstrate that climate impacts – including floods, droughts, and rising insurance costs – directly threaten MFI portfolios. Hence, there is a need for climate adaptation tools. An evaluation of the Central American Markets for Biodiversity (CAMBio) programme in Nicaragua shows that combining credit with incentives and technical assistance is insufficient without addressing local political–ecological dynamics (Bastiaensen et al., 2015).

Some studies also address credit risk and financial sustainability. According to J. H. Lee et al. (2015), adverse selection and moral hazard increase loan default risks in deteriorating economic contexts. Knewtson and Qi (2019) propose insurance mechanisms to correct mispriced microcredit risk and expand access for small businesses. Other contributions explore emerging sustainability practices. Nugroho et al. (2017) examine how Indonesian MFIs respond to environmental regulations, while Huybrechts et al. (2019) warn that green microfinance may reinforce exclusion unless local social–ecological processes are considered.

This stage also includes more quantitative evidence from throughout the world. In China, microcredit improves household welfare and women’s decision-making (Rahman et al., 2015). Allet and Hudon (2015) find that larger, bank-registered, and mature MFIs perform better environmentally. A comparison of MFIs in Europe and developing countries demonstrates that size and loan structure are linked to environmental performance (Forcella & Hudon, 2016).

There is also more of a focus on institutional features. Riggins and Weber (2017) develop a theory of peer-to-peer (P2P) microlending driven by information asymmetries, and Randøy et al. (2015) find that entrepreneur–CEOs achieve higher social performance, financial sustainability, and lower costs, though succession risks persist.

Overall, the second stage shows a clear shift from isolated environmental initiatives towards a more integrated, but still fragmented, understanding of how social, environmental, and financial goals interact in microfinance. These findings have set the stage for the multidimensional research developments during the most recent stage.

5.3. The third stage (2020–2025)

In the most recent stage, sustainable microfinance has become a consolidated and globally diversified field. The regional context is still relevant, but researchers often adopt integrated perspectives that combine financial, social, environmental, technological, and governance dimensions. The countries considered during this stage include Bangladesh (Atahau et al., 2021; Nuruzzaman et al., 2024), Cambodia (Guermont et al., 2025), India (Sangwan et al., 2023), Indonesia (Astawa et al., 2021; Kim & Huruta, 2025), Pakistan (Chen et al., 2025), China (Pei, 2024), Cabo Verde (Leite & Sá, 2024), Nigeria (Ngong et al., 2022), Organisation for Economic Co-operation and Development (OECD) countries (Ahmad & Satrovic, 2024). In addition, some scholars have used global datasets (Beisland et al., 2023; Dorfleitner et al., 2020; Lam et al., 2020).

A first line of research involves how green microfinance supports financial inclusion, women’s empowerment, and poverty alleviation. Ali et al. (2023) highlight the contribution of green finance to the SDGs through renewable energy, green transportation, energy efficiency, and green microcredit. Empirical evidence confirms this potential: renewable energy initiatives strengthen green microfinance and women’s empowerment in Bangladesh (Atahau et al., 2021); green MFIs have positive effects on women’s entrepreneurial skills and poverty reduction in Pakistan (Chen et al., 2025); and green microfinance policies, supported by credit and insurance, promote women’s economic freedom in China (Pei, 2024). Other studies incorporate cultural and behavioural elements. Astawa et al. (2021) examine how culturally

grounded MFIs in Indonesia reinforced sustainability and organisational performance during the COVID-19 pandemic. Zhao et al. (2025) extend this by showing that stakeholder awareness and knowledge ecology enhance financial inclusion through green finance.

A second research stream links green microfinance with financial literacy and gender empowerment. C. W. Lee and Huruta (2022) find that women's financial literacy significantly increases participation in green microfinance. Kim and Huruta (2025) confirm these effects for Indonesia, noting stronger impacts for women than for men.

A third area of interest addresses poverty and vulnerability throughout the world. In Nigeria, there is a long-run relationship between microfinance inclusion and poverty reduction (Ngong et al., 2022). Climate precarity in Cambodia drives borrowers to use credit for their daily survival rather than long-term adaptation (Guermond et al., 2025). Finally, Bangladeshi households that engage with MFIs exhibit lower social vulnerability, although climate vulnerability persists among those excluded from microfinance due to low education or health constraints (Nuruzzaman et al., 2024).

A fourth line of research involves an expansion of the institutional and performance dimensions. Lam et al. (2020) find that nonprofit MFIs translate social outcomes into financial success more effectively, whereas for-profit MFIs convert financial gains into social impact more efficiently. Dorfleitner et al. (2020) show that institutional maturity increases green energy lending, a finding that supports earlier work (Allet & Hudon, 2015; Forcella & Hudon, 2016). However, they also find that a larger share of female managers corresponds with weaker support for green lending (Dorfleitner et al., 2020). In Cabo Verde, while MFI managers perceive high environmental risks, they face knowledge and resource barriers (Leite & Sá, 2024).

Financial performance has also been revisited. According to Beisland et al. (2023), green MFIs display higher financial and social performance than previously reported. Durango et al. (2022) propose the use of risk-adjusted interest rate tools to strengthen competitiveness as banks enter the microfinance market.

Finally, there has been an increased focus on governance. Strong governance enhances outcomes (Halouani, 2025), and decentralised governance weakens ecological sustainability in OECD countries, though financial inclusion mitigates these effects while (Ahmad & Satrovic, 2024). Regulatory noncompliance is also a concern (Sangwan et al., 2023).

Overall, sustainable microfinance research has been consolidated during this stage. The field has transitioned from localised qualitative studies to more sophisticated quantitative and mixed-method approaches. Given the increasing intersection of the financial, social, environmental, governance, and technological dimensions, sustainable microfinance is now positioned as a multidimensional domain within the broader development and sustainability agenda.

Gaps and future directions

The evolution of sustainable microfinance reveals several research gaps.

First, the financial, social and environmental dimensions are still often examined separately. Future work should develop integrative frameworks explaining how MFIs simultaneously achieve financial sustainability, strengthen social capabilities and build climate resilience, considering institutional incentives, governance structures and development contexts (Ahmad & Satrovic, 2024; Halouani, 2025; Kabeer, 2003; Nojonen, 2003).

Second, stronger empirical evidence is needed. Much of the literature relies on case studies or cross-sectional country-level analyses, limiting external validity. Future studies should use longitudinal, cross-country and mixed-method designs, integrate climate and socio-economic vulnerability metrics, and develop harmonised yet context-sensitive ESG and impact indicators for MFIs (Beisland et al., 2023; Lam et al., 2020; Zhao et al., 2025).

Third, climate vulnerability and environmental sustainability require deeper analysis. Existing studies identify promising initiatives in renewable energy and green lending, but evidence remains limited on long-term impacts, distributive effects, debt exposure and links with state-led adaptation strategies (Allet & Hudon, 2015; Atahau et al., 2021; Forcella & Hudon, 2016). Fourth, gender and household dynamics remain underdeveloped. Research should move beyond financial indicators to examine how financial literacy, digital access, intra-household bargaining, community norms and intersectional factors mediate empowerment outcomes (Chen et al., 2025; C. W. Lee & Huruta, 2022; Pei, 2024).

Fifth, governance, institutional quality and digital transformation need stronger conceptualisation. Internal governance, leadership, decentralisation, regulatory capacity and consumer protection shape the ability of MFIs to deliver sustainable outcomes, while digital tools may reduce costs and expand outreach but also intensify exclusion, privacy and bias risks (Ahmad & Satrovic, 2024; Halouani, 2025; Lam et al., 2020; Leite & Sá, 2024; Zhao et al., 2025).

In summary, future research should connect microfinance more explicitly with structural transformation, institutional quality, climate adaptation and inclusive technological change. Sustainable microfinance is not merely a financial tool but a multidimensional development strategy for strengthening resilience and reducing vulnerability.

Conclusions

This study provides the first integrated bibliometric and systematic review of sustainable microfinance based on Web of Science and Scopus articles published between 1999 and 2025. The field has shifted from a welfarist perspective centred on poverty alleviation and women's empowerment, to an institutionalist perspective emphasising financial self-sufficiency, and finally to a multidimensional sustainability framework incorporating climate resilience, gender equality, governance and digital transformation. Although financial, social and environmental dimensions structure the field, they remain unevenly integrated. Recent work highlights the

potential of sustainable microfinance to support environmental protection, renewable energy and climate adaptation, while also identifying persistent challenges related to mission drift, the financial viability of green products, gendered impacts and institutional constraints (Ahmad & Satrovic, 2024; Atahau et al., 2021; Beisland et al., 2023; Chen et al., 2025; C. W. Lee & Huruta, 2022; Dorfleitner et al., 2020; Halouani, 2025; Leite & Sá, 2024; Moser & Gonzalez, 2015, 2016; Nuruzzaman et al., 2024; Pei, 2024).

The review contributes by showing how sustainable microfinance intersects with climate vulnerability, persistent inequalities, digital divides and governance challenges (Beisland et al., 2023; Forcella & Hudon, 2016; Lam et al., 2020; C. W. Lee & Huruta, 2022; Zhao et al., 2025). These findings suggest that microfinance can complement public policies on green finance, women's empowerment, financial literacy, climate-risk management and digital inclusion.

The agenda ahead requires integrative theoretical models linking financial performance with social and environmental outcomes, more robust longitudinal and comparative evidence, harmonised sustainability indicators for MFIs, deeper attention to household and community dynamics, and a better understanding of how institutional quality and digital transformation shape development effects (Gutiérrez-Nieto & Serrano-Cinca, 2019; Hermes & Hudon, 2019; Ahmad & Satrovic, 2024; Halouani, 2025).

Overall, sustainable microfinance is a promising but still under-theorised domain within development research. Its potential lies not simply in expanding credit access, but in contributing to inclusive and climate-resilient development pathways in the Global South.

Declaration of interests

The authors declare that they have no competing financial or personal interests that could have influenced the work reported in this manuscript.

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