Advances in Consumer Research
https://acr-journal.com/
Volume-2 | Issue-6 | Dec: 2025
Original Researcher Article

Mapping The Intersection Of Financial Inclusion And Green Finance: A Bibliometric Analysis Of Sustainability Trends

Samira Troudi1[1]*, Sami Aouadi[2]
[1]*Department of economics, Faculty of Science, Economics and Management of Tunis, Tunis,
Email ID : troudisamira173@gmail.com
[2]Department of economics, Faculty of Science, Economics and Management of Tunis, Tunis,
Email ID : sami.aouadi@fsgt.utm.tn

Acceptance- 22/12/2025
Received- 17/10/2025
Published: 29/12/2025

ABSTRACT
Financial inclusion is a crucial tool in sustainable resource management development because it provides people and businesses with financial resources, which include loans, grants, and investments to support the stewardship of the environment. This study investigates the role of financial inclusion and accessibility of green finance in consumer and corporate behaviour in resource management in particular with regard to the issue of climate changes. The novelty in the study further investigates the influence of behavioral biases, i.e. overconfidence, loss aversion and myopia on decision-making processes associated with resource efficiency within a high resource intensity industry. Using VOSviewer, a bibliometric analysis was performed to determine existing trends, publications that have impact, and the main gaps in the research in this field. The results confirm the fact that green finance efforts have a transforming potential, and at the same time, the policies should be implemented to combat cognitive biases to increase the effectiveness of sustainability efforts..
Keywords: Sustainable Resource Management, Behavioral Biases , Green Investments, Climate Change Adaptation, Corporate Decision-Making, Behavioral Economics
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1. INTRODUCTION:

Sustainable resource management is being seen to be a major factor in achieving global climate targets and creating a resilient economic system. Financial inclusion, in my definition of it as being a wide-ranging and inexpensive access to financial services including accounts, credit, and saving, has not only become a poverty-reduction instrument but also a kind of place of origin of environmentally sustainable behaviour on the part of households and firms. The recent systematic review reveals the increasing intersection of financial inclusion and sustainable finance where inclusive access to financial products has the potential to hasten sustainable development by allowing underserved populations to engage in economic activities and at the same time meet environmental goals [1]. Green finance, a subdivision of sustainable finance encompassing such instruments as green loans, green bonds, and targeted credit to environmentally positive projects, have become popular as a component of international policies that are consistent with climate reduction and resource efficiency ([2], [3]).

There is empirical evidence, which states that financial inclusion has the potential to affect green economic outcomes. As an example, it has been found that financial inclusion contributes to green growth in emerging economies by facilitating investments in technologies and activities in line with the sustainability goals [4]. At the same time, mechanisms of digital and inclusive finance have been associated with structural changes to more environmentally friendly routes, which give households and businesses the opportunity to fund energy-saving or environmentally conscious projects [5]. Such results are buttressed by more general conceptual models that state that inclusive financial services, specifically designed with the aim of sustainability, would allow vulnerable populations to deal with climate risks, establish resilience to environmental shocks, and implement sustainable practices [6].

In spite of these promising links, the overall implications of behavioural biases on the adoption and success of green finance products are not yet developed. Behavioural finance, the science that studies the influence of the psychological dynamics of overconfidence, loss aversion and present bias on financial decisions, to explain why people and companies occasionally make decisions that are economically rational and sustainable in nature [7]. Recent arguments assume that these biases may be realized in choices to make related to sustainable investments, under-investments in technologies that use less resources or a discrepancy between the professed environmental concern and the reality of the financial decision making [8], [9]. As an illustration, herd behaviour or overconfidence in well-known technologies will inhibit the desire to implement new resource-efficient practices despite the existence of green loans.

A combination of these threads of literature divulges some significant matters. To begin with, access to financial services and its specialized green financing is both necessary but not sufficient preconditions to promote sustainable resource management. Second, financial inclusion can only translate to sustainable behaviour when both the structural and psychological barriers are

considered concomitantly with the products on offer. Lastly, the body of literature highlights meaningful knowledge gaps at the nexus of financial inclusion and green finance and behavioural decision-making, which guides the future study to explicitly model the restraining or mediating impact of cognitive biases to the outcomes of inclusive financial services on the outcome of resource-efficiency. This kind of integrated view holds the potential of understanding more about how the financial structures may be enhanced to achieve the goals of sustainable resource management by harmonizing individual and corporate incentive with the goals of individual and corporate objectives.

Therefore, this paper aims at questioning the relationship between financial inclusion and green finance in determining consumer and corporate behaviour regarding sustainable resource management, and also questions the effects of behavioural biases on the uptake of resource-efficient behaviour.

2. LITERATURE REVIEW

Financial Inclusion and resource management

The broad understanding of financial inclusion as having access to convenient and affordable financial products and services has been commonly cited as an economic inclusion factor in economic participation and resilience. Recent studies suggest that financial inclusion has the possibility to affect environmental and sustainability performance; such as changing access to credit and savings which can lead to the investment of households and firms in energy-efficient technologies or adaptive practices that can facilitate resource efficiency over the long-term [1], [11]. Inclusive financial systems in developing nations can help the underserved segments of the population to participate in economic activity that is both sustainable and in line with the sustainability objectives, especially in cases when financial services are combined with green incentives [11]. Despite the fact that certain research still argues about the macroeconomic impact of financial inclusiveness on the growth outcomes, the interdependence with sustainable practices has become a relevant theme in literature [10].

Green Investments and Sustainability

Financial products and services that facilitate environmentally friendly operations have become more notable as a tool towards encouraging mitigation of climate change and sustainable management of resources. Several researchers have already emphasized that green finance can be used to mobilize funds to low-carbon infrastructure and environmentally friendly activities [2], [11]. Empirical studies have discussed the intersection of financial inclusion with both green innovation and economic growth with both a net negative impact in some settings and a net positive impact in others, as financial inclusion opens access to green finance and enables the use of environmental technology [11]. Integrated frameworks comprising of green finance and financial inclusion policies have also been promoted by the policy literature to promote better environmental outcomes and access to finance [3].

Biases in Behavior and Resource Productivity

The role of cognitive biases in influencing financial decisions is highlighted by behavioral economics: it can be overconfidence, present bias, or framing effects. Such biases may affect the manner in which people obtain financial services as well as the decision making processes of the people concerning sustainable practices in relation to investment decisions. As has been noted in the behavioral finance literature, biases such as overconfidence and risk perception do substantially influence the behavior of investment and involvement with online financial services [12], [8]. An example can be a scenario where the overconfidence causes the underestimation of the long-term environmental risks or over-reliance on known financial opportunities that are not conducive to the sustainability agenda. Studies that show a specific interest in the overlap of behavioral biases and financial inclusion have shown that behavioral biases are obstacles to complete interaction with financial systems, and as such, restrict the possibility of inclusive financial services to provide sustainable results [13].

The Intersection of Financial Inclusion, Green Finance and Behavioral Biases

Although the two areas of research on financial inclusion, green finance, and behavioral decision-making are separated, there are still no studies that combine these areas. Theoretical research proposed models of the relationship between behavioral impediments to the financial inclusion outcomes and mobilization of resources, indicating that the impact of the inclusion-focused financial approach can be reinforced by cognitive bias mitigation [13]. Furthermore, digital inclusive finance is a leading edge where technology, financial access, and sustainability objectives meet, which can influence economic green transformation in combination with behavioral insights [5]. As a result, the literature shows that there is a considerable gap in the knowledge about how behavioral biases mediate the success of the financial inclusion and green finance programs to facilitate sustainable resource utilization, which calls on the need to conduct additional empirical and bibliometric research.

3. METHODOLOGY

Research Design

In the current study, a bibliometric method is used to research the intersection of the concept of financial inclusion and green finance and behavioral bias in ensuring sustainable management of resources. The bibliometric analysis makes it possible to identify and visualize the research trends, important authors, and powerful articles in the interdisciplinary sphere systematically. The bibliometric method is quite capable of monitoring the development of research and identifying emerging themes and significant works of influence on the academic discourse, as presented by Troudi and Aouadi [14].

Time Frame Selection

This bibliometric analysis has been selected with a period of 10 years (2015 through 2025). This era creates a

balance between the capture of the latest trends and the comprehension of the research world development. The period of 10 years allows the study to span the background publications and the relatively new trends in the intersection between financial inclusion, green finance, and behavioral biases so that a full picture regarding the evolution of these themes can be obtained [15], the time frame of 10 years gives enough background of history to perceive long-term trends but still capture the latest development in the fast-growing areas. This timeline is particularly applicable in following such themes as green finance that have become more popular over the past ten years as climate change worries turn into a more pressing issue.

Data Collection

The information to use in this bibliometric analysis was gathered in well-known academic databases, such as Google Scholar, Web of Science, and Scopus. The keywords were based on the main themes: financial inclusion, green finance, sustainable resource management, and behavioral biases. Relevant publications were identified using such keywords as financial inclusion, green finance, sustainability, climate change, green investments, and behavioral finance.

4. RESULTS

Publication Trends and Descriptive Analysis

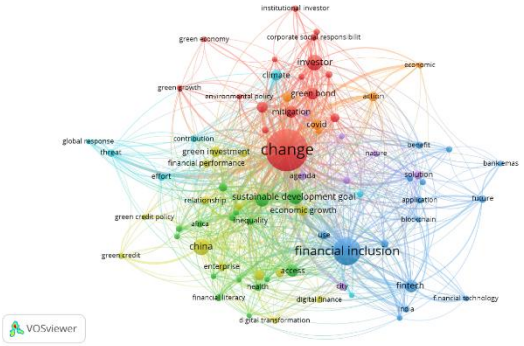
The convergence of financial inclusion, green finance, sustainability, and behavioural finance can be explained by the bibliometric results that were produced by Publish or Perish and VOSviewer. In a sample of 1,000 articles (published 2015-2025) the number of citations is 406,574 and is an indicator of an increasing academic interest that has been especially active in the past five years (table 1). The increase in the number of citations per article proves the development of popularity and impact of this research line.

Table1. Metrics from Publish or Perish

Metrics
Publication years: 2015-2025
Citation years: 10 (2015-2025)
Papers: 1000
Citations: 406574
Citations/year: 40657.40 (acc1=997, acc2=996, acc5=991, acc10=984, acc20=923)
Citations/paper: 406.57
Citations/author: 204295.47
Papers/author: 459.40
Authors/paper: 2.91/3.0/2 (mean/median/mode)
Age-weighted citation rate: 115411.80 (sqrt=339.72), 22991.83/author
Hirsch h-index: 331 (a=3.71, m=33.10, 272778 cites=67.1% coverage)
Egghe g-index: 584 (g/h=1.76, 341770 cites=84.1% coverage)
PoP hI,norm: 213
PoP hI,annual: 21.30
Fassin hA-index: 146

Co-Citation Analysis and Network Clustering

Based on the VOSviewer co-occurrence network, it is clear that the scholarly research on the topic of financial inclusion and green finance has been disintegrated into separate but overlapping groups, each of which addresses a specific aspect of sustainability. In this connection, the major clusters are listed below with their relevance to your study (figure 1):



Cluster 1 (red): Green Investment and climate change.

In this cluster, there are the terms, green economy, climate change risk, green bond, and sustainable investment. It points to a strong scholarly interest in the way in which financial systems respond to climatic change by highlighting the role of finance as the champion of sustainability. The cluster is inherently connected to the intersection of green finance with sustainability goals, which supports the thesis that the sphere of financial mechanisms can create a sustainable approach to managing resources. Institutional investors involvement in green activities has been an inseparable part of the literature focus on the use of fiscal tools needed to reduce climate risks.

Cluster 2(green): Financial Inclusion and Development in the New Economies.

In this case, one is looking at the way in which financial inclusion alleviates the situation in such areas like Africa and Nigeria, with the most relevant notions being the environment degradation, financial literacy, and poverty. This highlights the nexus between financial inclusion and sustainable development, where access to the financial services would be one of the critical facilitators of addressing environmental and social issues. This fits perfectly well in the aim of your study to identify how financial inclusion is likely to improve resource management by providing a fair access to green finance.

Cluster 3 (blue) Financial Services and Fintech.

Some of the keywords in this cluster include: fintech, financial inclusion, blockchain and digital finance. The obvious appearance of fintech and the digital transformation is the indication of the technological determinism of the green finance improvement and the growth of financial inclusion. Digital finance has made green financing more accessible and, therefore, has the potential to hasten sustainable resource management.

Cluster 4 (yellow): Green Policies and Green Performance.

Of interest here is the green credit policies and their ability to enhance financial sustainability especially in places such as China. The cluster preempts the significance of policy frameworks which balance financial markets with the Sustainable Development Goals (SDGs). Its applicability to your study is that it unravels how the green credit and financing policy could be used to encourage more environmentally friendly corporate and consumer behaviours.

Cluster 5 (purple): SDGs and Global Challenges.

Such themes as sustainable development goals, climate change, and global response have been included in this cluster as well, which highlights the global aspect of the sustainability concept and the necessity of concerted efforts on the part of both governments and businesses. It can therefore be seen that financial systems are important players in the stimulation of sustainable development with implications on the financial inclusion policy and the green finance mechanisms in the international arena.

Cluster 6 (baby blue) Behavioural Insights and Climate Change Mitigation.

This cluster contains such words as efforts, mitigation, and global warming. The key issue is the influence of the behavioural prejudices and decision-making process on the implementation of green finance solutions. Empirical research indicates that cognitive biases such as overconfidence and loss aversion, often inhibit the best decision-making in the environment and finance, and thus indicate the presence of tailored financial goods and policies necessary to reduce these biases.

5. DISSCUTION AND CONCLUSION

The bibliometric analysis performed with the use of Publish or Perish demonstrates a significant increase in the scholarly interest to financial inclusion, green finance, and sustainability between 2015 and 2025. A set of 1,000 publications were found, and it gave 406,574 cites that highlight the increased relevance of these interrelated areas. This is testified by the average citation rate of 406.57 per paper, and an h-index of 331, which is a strong indication of the scholarly impact this field has on the discussion of scholarly knowledge and policy discussions. The strong increase in articles, especially in the last five years of analysis, reflects a heightened interest in sustainability issues and climatic crisis around the world, and therefore, green finance is a key tool to discuss the given problems.

The compilation of more than 2,000 empirical research about environmental, social, and governance (ESG) dimensions creates a conclusive connection between sustainable finance and financial performance, as Friede et al. describe [16]. Such results support our bibliometric observations, where green bonds, sustainable investment, and climate finance have become the leading topics of research. The promotion of green finance as an effective tool of financing sustainable businesses, the examples of which include research by Tietenberg and Lewis [17], is a relevant part of the changing line of research.

The proliferation of digital finance and its integration with financial inclusion is a timely trend that can be found in the analysis. The role of fintech innovations in increasing the prospects of green finance is becoming more conspicuous as fintech innovations gain momentum. Demirguc-Kunt et al. [18] have contributed a seminal work that still has many references in the modern literature, which explores the impact of the fintech revolution on financial inclusion. This highlights blockchain technology and various digital financial services as key facilitators in providing green financing to the underserved communities, particularly in the developing economies.

The artificial intelligence (AI) application to financial services has also been explored in the recent literature. Kumar et al. [19] state that AI and machine learning can help to renew financial inclusion practices to make green investment strategies more targeted and efficient. This technological shift is not only essential to make the accessibility more effective, but also, make the green investments more efficient due to the simplified decision-making process and the reduction of risks related to sustainability projects.

A theme that has been identified through the bibliometric survey is the impact of behavioral biases on green finance and investment decisions. Cognitive biases, such as loss aversion, overconfidence, and herding, have a major influence on the behavior of individual and corporate investment. According to Baker et al. [20], these biases often trigger inappropriate decisions that hinder the investment in green technologies and sustainable projects. Later empirical studies support the belief that financial inclusion policies may be designed in such a way as to overcome these obstacles and encourage more sustainable decision-making.

Incorporating behavioral finance in green finance models can maximize the adoption of sustainable investments especially where actors are faced with increased perceived risks or uncertainty in green markets. The integration is expected to deliver better informed and rational decision outcomes meaning that it will enhance better resource efficiency and environmental impact. More empirically driven research including the one advanced by Park and Jang [21] is needed to specify how manner in which financial instruments and policy can be customized to respond to these biases in an effective manner.

Another central theme that comes out is the strategic role of institutional investors in driving green investment. Gomber et al. [22] emphasise the increased investment by the institutional investors in green projects mostly through green bonds and sustainable investment portfolios. According to the Publish or Perish results, there is a significant increase in the research on green bonds that is a type of financial tool to enable investors to invest in climate-related projects. This is in tandem with Bauer et al. [23] who illustrate that green bonds form a critical channel of promoting the low-carbon transition.

The fact that institutional investor adherence to ESG standards has been correlated with the rise in prominence of impact investing, and the fact that financial markets are becoming more and more aligned with sustainability goals. Such alignment is especially functional, because it

provides the much needed capital to fund massive green innovations and climate mitigation measures.

The existing literature has emphasized the idea that financial inclusion is one of the pillars of sustainable development and its potential is yet to be utilized. The research agenda in the future needs to focus on the development of policy frameworks that would combine green finance, financial inclusion, and behavioral finance. Policymakers are required to weigh the incentive systems that can attract investment in sustainable businesses, but at the same time, they should reduce the cognitive biases that can hinder the process of making sound decisions.

Furthermore, since the concept of green finance is currently developing, more research is justified on macroeconomic models that can be entangled with these thematic cordials. Research reports like those by Fankhauser, et al. [24] discuss the need to ensure financial regulators are enabling the green transition by recalibrating monetary policy and financial regulation in a style that encourages macro level green investment..

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