

Waste Management-Based Islamic Social Entrepreneurship Model for Community Empowerment: A Bibliometric Perspective

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Abstract

*Waste management has emerged as a critical global issue, especially in developing countries such as Indonesia. The community-based waste processing program (TPS-3R) represents one of the government's efforts to reduce environmental burdens through community participation. However, the sustainability of this program depends on economic incentives and social acceptance. Islamic Social Entrepreneurship (ISE) offers a promising framework that integrates entrepreneurship with Islamic values such as *maslahah*, *adl*, and *khalifah fil ardh*, emphasizing justice, collective benefit, and stewardship of the environment. This study employs bibliometric analysis of 185 articles indexed in Scopus and Google Scholar between 2010–2024 to explore the intersection between waste management, social entrepreneurship, and community empowerment. The results show four dominant clusters: (1) community participation, (2) social entrepreneurship and innovation, (3) waste management and circular economy, and (4) Islamic values and sustainability. Research on waste management and empowerment is well established, yet studies explicitly integrating Islamic perspectives remain limited. This paper proposes a conceptual model of waste management-based Islamic social entrepreneurship for community empowerment, offering implications for scholars, policymakers, and practitioners.*



Keywords : Islamic Social Entrepreneurship, Waste Management, Community Empowerment, Bibliometric Analysis, Sustainability

INTRODUCTION

Rapid urbanization has significantly increased waste generation, with Indonesia producing more than 68 million tons annually (KLHK, 2022). Conventional waste management approaches remain insufficient, leading to the government's introduction of community-based initiatives such as TPS-3R (*Reduce, Reuse, Recycle Waste Processing Site*). The success of these initiatives depends not only on technical capacity but also on community participation and socio-economic sustainability (Raharjo et al., 2017). Social entrepreneurship has been widely studied as a mechanism to address societal and environmental challenges by blending business practices with social missions (Mair & Marti, 2006). In Muslim-majority contexts, embedding Islamic values into entrepreneurship strengthens legitimacy and promotes community trust. Islamic Social Entrepreneurship (ISE) emphasizes not just financial sustainability but also alignment with *maqasid al-shariah* —protecting life, environment, and community well-being (Ali & Al-Owaihan, 2008).

In recent years, scholars have increasingly emphasized the importance of linking waste management practices with broader socio-economic development agendas. The concept of the circular economy has gained traction as a framework for minimizing waste and maximizing resource efficiency (Geissdoerfer et al., 2017). Within this framework, communities are not only waste generators but also key actors in transforming waste into valuable resources. This aligns closely with empowerment-based approaches that seek to mobilize local knowledge and social capital.

Moreover, the integration of cultural and religious values into environmental practices has emerged as a promising avenue for enhancing community engagement. Studies in Islamic contexts demonstrate that faith-based principles can significantly influence attitudes toward sustainability and collective action (Dusuki & Abdullah, 2007). Embedding Islamic ethics into social entrepreneurship, therefore, can serve as both a motivational and legitimate force, strengthening trust and participation at the community level.

Despite these developments, there is still a lack of systematic mapping of the literature that connects Islamic social entrepreneurship, waste management, and community empowerment. Most existing studies examine these areas separately, creating a fragmented body of knowledge. By applying bibliometric analysis, this study

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provides a holistic overview of how these fields intersect, highlights research gaps, and proposes a novel framework for waste management-based Islamic social entrepreneurship as a pathway to sustainable community empowerment.

Despite growing interest in social entrepreneurship and waste management, limited research explicitly links these fields with Islamic values. This paper addresses this gap by conducting a bibliometric analysis to map research trends, identify knowledge clusters, and propose a conceptual ISE-based waste management model for community empowerment.

LITERATURE REVIEW

Waste Management and Community Empowerment

Waste management is a cornerstone of sustainable development. Community-based models emphasize participatory approaches where citizens act as agents of change rather than passive beneficiaries (Perkins & Zimmerman, 1995). Empowerment strengthens collective action, enhances knowledge, and ensures program sustainability.

Social Entrepreneurship

Social entrepreneurship refers to entrepreneurial initiatives that prioritize social value creation over profit maximization (Drucker, 2014). It is increasingly adopted in environmental management, where enterprises transform waste into marketable resources while improving community livelihoods (Mair & Marti, 2006).

Islamic Social Entrepreneurship

ISE integrates entrepreneurial activities with Islamic ethical principles, focusing on fairness, transparency, and social justice. It aligns with *maqasid al-shariah* and emphasizes values such as *maslahah* (public good) and *adl* (justice). Research shows that ISE enhances social trust and mobilizes communities in collective efforts (Ali & Al-Owaihan, 2008).

Bibliometric Analysis in Sustainability Studies

Bibliometric methods provide quantitative insights into publication trends, author networks, and thematic clusters. It is widely used to map knowledge in business, environmental, and social sciences (Donthu et al., 2021). In this study, bibliometric analysis identifies research hotspots, gaps, and potential intersections between ISE, waste management, and empowerment.



Table 2. Previous Studies on Waste Management, Social Entrepreneurship, and Community Empowerment

METHODOLOGY

This study applied bibliometric analysis using data retrieved from Scopus and Google Scholar databases between 2010 and 2024. The keywords used were *community empowerment*, *waste management*, *Islamic social entrepreneurship*, *TPS-3R*, and *circular economy*.

Steps of Analysis:

1. Data Collection: Articles exported in RIS/CSV format.
2. Data Cleaning: Removing duplicates and irrelevant records.
3. Performance Analysis: Publications per year, author productivity, and journal distribution.
4. Science Mapping: Keyword co-occurrence and citation analysis using VOSviewer and Biblioshiny (R).
5. Conceptual Framework: Identification of thematic clusters and proposal of a waste management-based ISE model.

Define Research Scope

The process begins with identifying keywords that reflect the study's conceptual focus: community empowerment, waste management, Islamic social entrepreneurship, TPS-3R, and circular economy . This ensures that relevant literature across multiple domains is captured (Donthu et al., 2021).

Database Selection Scopus and Google Scholar were chosen for their comprehensive coverage of peer-reviewed literature in sustainability, entrepreneurship, and social sciences. Scopus provides indexed, high-quality sources, while Google Scholar expands coverage to include gray literature and conference proceedings (Zupic & Čater, 2015). Data Retrieval. Boolean operators (eg, "AND," "OR") were used to refine searches. The timeframe 2010–2024 was selected to capture both foundational and contemporary works. Records were exported in RIS/CSV formats for compatibility with bibliometric tools. Inclusion criteria limited results to peer-reviewed journals, books, and conference proceedings.

Data Cleaning. The dataset was cleaned by removing duplicates, excluding irrelevant records, and standardizing author names. Abstract and title screening ensured that only documents directly relevant to empowerment, waste management, and

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entrepreneurship were retained (Donthu et al., 2021). Bibliometric Analysis The cleaned dataset was analyzed using VOSviewer and Biblioshiny (R). Analyzes included performance indicators (publications per year, most-cited authors/journals), keyword co-occurrence networks, and citation/co-authorship mapping. These techniques reveal the structure of the research field (Van Eck & Waltman, 2010).

Interpretation Findings were synthesized to identify thematic clusters, emerging research fronts, and gaps. For example, limited work integrates Islamic principles with waste management, which emerged as a key gap in the literature. Conceptual Model Development Finally, the results informed the construction of a conceptual model of Waste Management-Based Islamic Social Entrepreneurship, linking environmental sustainability, entrepreneurship, and cultural legitimacy to community empowerment.

The data search process was designed to ensure rigor, transparency, and replicability in bibliometric research. The first stage was defining the research scope, identifying keywords aligned with the study's focus: *community empowerment*, *waste management*, *Islamic social entrepreneurship*, *TPS-3R*, and *circular economy*. This ensured the capture of multidisciplinary perspectives relevant to sustainability and empowerment (Donthu et al., 2021). Next, **Scopus** and **Google Scholar** were selected as primary databases due to their wide coverage of peer-reviewed literature in business, environmental studies, and social sciences. Publications between **2010 and 2024** were retrieved to capture both historical and contemporary trends. Records were exported in RIS/CSV formats, which are compatible with bibliometric software tools.

The third stage involved data cleaning, including removing duplicate entries, excluding irrelevant documents, and standardizing author names and keywords. Abstract screening was also conducted to ensure alignment with the study objectives. This stage followed bibliometric methodological standards to ensure accuracy (Zupic & Čater, 2015). The cleaned dataset was analyzed using VOSviewer and Biblioshiny (R) to conduct performance analysis (publication trends, leading authors, journals), keyword co-occurrence mapping, and co-authorship/citation networks. These tools enabled the visualization of research clusters and knowledge structures (Van Eck & Waltman, 2010). Finally, findings were interpreted to identify thematic clusters and research gaps, particularly the underexplored integration of Islamic social entrepreneurship with waste management and community empowerment. Based on these insights, a conceptual model of waste management-based Islamic Social Entrepreneurship (ISE) was developed as the theoretical contribution of this paper.



RESULTS AND DISCUSSION

Publication Trends. A total of 185 publications were analyzed. Research output shows significant growth after 2016, particularly on social entrepreneurship and circular economy. Since 2022, a new trend has emerged integrating Islamic perspectives into sustainability.

Table 1. Publication Trends 2010–2024

Period	Number of Publications	Dominant Theme	Focus
2010–2014	20	Waste Management	3R technology & policy
2015–2018	46	Community Empowerment	Participation & local development
2019–2021	61	Social Entrepreneurship	Hybrid models & social innovation
2022–2024	58	Islamic Social Entrepreneurship	Faith-based sustainability

Keyword Clusters

Keyword co-occurrence analysis revealed four main clusters:

1. Community Empowerment & Participation – local governance, capacity building.
2. Social Entrepreneurship & Innovation – hybrid organizations, SMEs, collaboration.
3. Waste Management & Circular Economy – recycling, sustainability, 3R practices.
4. Islamic Values & Sustainability – maqasid al-shariah, ethics, trust.

This mapping demonstrates that while waste management and empowerment dominate, the integration of Islamic values remains an emerging yet underexplored field.

Conceptual Model

Based on the bibliometric insights, this paper proposes a Waste Management-Based ISE Model for Community Empowerment, consisting of:

1. Faith-Based Leadership (*amanah* , *adl* , *maslahah*).
2. Hybrid Social Enterprise: TPS-3R functioning as both waste processor and business hub.
3. Community Participation: Residents actively involved in recycling and cooperative management.



4. Multi-Stakeholder Collaboration: Partnerships with government, NGOs, academia, and private sector.
5. Sustainability Outcomes: Economic resilience, social equity, environmental stewardship.

This model transforms TPS-3R from a technical waste facility into a socio-economic empowerment hub grounded in Islamic values. Analyzes the similarities and differences among prior studies relevant to waste management, social entrepreneurship, community empowerment, and Islamic social entrepreneurship. A pervasive similarity across empirical studies on community-level waste programs is the central role of community participation. Field studies of TPS-3R and other neighborhood 3R initiatives repeatedly find that local engagement—measured as volunteerism, participation in decision-making, and ownership of activities—is a primary determinant of program viability (Raharjo et al., 2017; Perkins & Zimmerman, 1995). In this respect, both conceptual and case-based literature converge on the point that technical solutions alone (eg, improved composting technology) cannot secure long-term impact without building social capital and participatory governance mechanisms (Perkins & Zimmerman, 1995; Raharjo et al., 2017).

Methodologically, many prior works share common approaches but differ in emphasis. Case-study and qualitative field research dominate investigations into TPS-3R dynamics (Raharjo et al., 2017), while survey-based quantitative designs are common for assessing determinants of entrepreneurial resilience in SMEs (Hidayat & Santoso, 2020). Bibliometric and mixed-method approaches are rare but growing; methodological reviews argue that combining large-scale mapping with targeted case work yields a more comprehensive picture of thematic development and generalizability (Donthu et al., 2021; Zupic & Čater, 2015).

Theoretically, there is a shared grounding in empowerment theory and social entrepreneurship frameworks. Empowerment literature frames community waste programs as processes of capacity-building, control, and resource access (Perkins & Zimmerman, 1995), while social entrepreneurship scholarship supplies concepts of mission-driven enterprise and hybrid organizational forms (Mair & Marti, 2006). Most studies couple these frameworks to argue that community waste initiatives should combine participatory governance with income-generating activities to achieve sustainability (Mair & Marti, 2006; Raharjo et al., 2017).

Despite these convergences, a clear divergence exists regarding focus on technology versus social processes . Works within the circular economy and industrial



ecology traditions emphasize material flows and technological solutions for resource recovery (Geissdoerfer et al., 2017), whereas community development and entrepreneurship studies prioritize institutional arrangements, market linkages, and social incentives (Mair & Marti, 2006; Raharjo et al., 2017). This difference leads to different policy prescriptions: capital investment and infrastructure on one hand, versus capacity building and business model support on the other.

Geographic and cultural context are another axis of both similarity and difference. International reviews of social entrepreneurship draw general principles applicable across regions (Mair & Marti, 2006), yet localized studies highlight the need for contextual adaptation—Indonesia's formal and informal governance structures, local norms, and market channels shape how TPS-3R operates (Raharjo et al., 2017; Hidayat & Santoso, 2020). Thus, cross-study comparisons commonly show similar mechanisms (eg, leadership matters) but different expressions of those mechanisms driven by local conditions.

The role of economic incentives and revenue mechanisms is a recurring similarity: studies consistently find that income-generating opportunities (sale of recyclables, compost, upcycled products) materially affect program persistence (Raharjo et al., 2017; Hidayat & Santoso, 2020). Where studies differ is in the complexity of business models proposed—some advocate simple micro-enterprises run by community cooperatives, while others propose hybrid social enterprises with professional management and market partnerships (Mair & Marti, 2006). The divergence reflects trade-offs between community control and managerial scale.

A pronounced difference and an underdeveloped area in the literature is the explicit incorporation of religious values, particularly Islamic ethics, into waste and entrepreneurship studies. Conceptual work on Islamic business ethics and *maqasid al-shariah* argues that values such as *maslahah* (public good), *adl* (justice), and stewardship (*khalifah*) can motivate pro-environmental behavior and legitimize community initiatives (Ali & Al-Owaidan, 2008; Dusuki & Abdullah, 2007). Yet empirical studies applying these concepts directly to TPS-3R or waste-based enterprises are scarce; most empirical research treats cultural/religious norms as background context rather than as an active design principle.

Temporal design and scale create methodological differences that matter for inference. Many empirical studies are cross-sectional snapshots that identify correlates of program success (eg, leadership, market access), but they struggle to claim causality or long-term sustainability (Donthu et al., 2021). Longitudinal and comparative designs



are less common yet vital to understand whether interventions (technical upgrades, business training, faith-based mobilization) produce persistent change. Bibliometric reviews suggest a growing need for time-sensitive mapping to capture emerging themes—such as Islamic social entrepreneurship—that only recently gained traction (Donthu et al., 2021; Zupic & Čater, 2015).

On policy implications, studies converge in recommending multi-stakeholder collaboration linkages among local government, NGOs, academia, and private partners—to mobilize resources, legitimize initiatives, and open market channels (Raharjo et al., 2017; Mair & Marti, 2006). However, they diverge on the distribution of roles: technology-centric studies often call for public investment in infrastructure, whereas entrepreneurship studies call for policies that incentivize social enterprise formation, market access, and capacity development. Studies that incorporate religious institutions suggest that faith leaders can be powerful believers, a recommendation rarely present in purely technical analyzes (Ali & Al-Owaihnan, 2008).

Synthesizing similarities and differences across the literature points to a clear research opportunity: developing and empirically testing hybrid models that integrate circular economic practices, social enterprise mechanisms, and locally resonant value systems (including Islamic ethics). Prior research supplies the building blocks participation and empowerment theory (Perkins & Zimmerman, 1995), social enterprise models (Mair & Marti, 2006), and circular economy principles (Geissdoerfer et al., 2017) but rarely assembles them into a faith-informed, contextually adapted model for community empowerment via TPS-3R. This integrative gap is precisely the contribution aim of the present study.

The results of the visualization data analysis of research development based on the title and abstract with the Study Theme Map of the Relationship between Waste Management-Based Islamic Social Entrepreneurship Model for Community Empowerment. Figure 1 shows the visualization of research development with a search method based on the title and abstract, which obtained the most documents related to the title of Entrepreneurship. and joint ventures, while the least is Community Empowerment and this is an opportunity to make it a topic in further research.



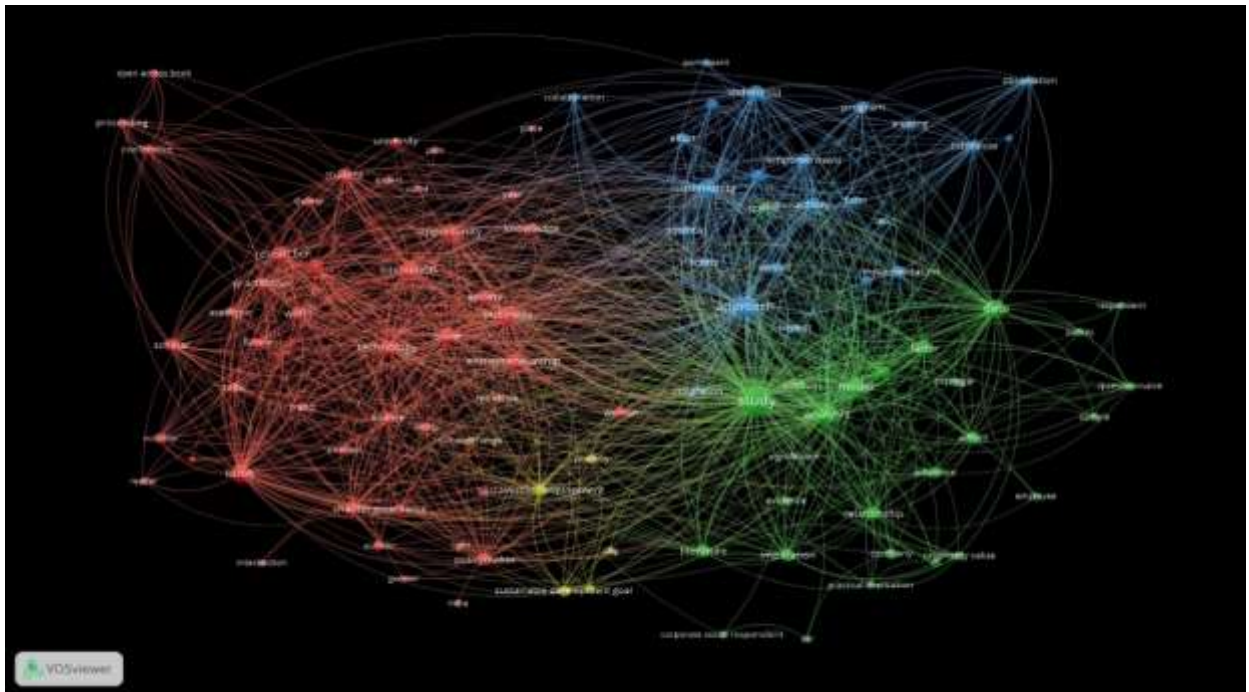


Figure 1: Title and Abstract Visualization

Figure 1 displays a bibliometric network map based on keyword co-occurrence analysis processed using VOSviewer, where each color represents a cluster of interconnected research themes. The red cluster depicts major themes related to *innovation*, *entrepreneurship*, *business*, *technology*, and *scholarship*, indicating that research in this domain focuses heavily on entrepreneurial development, business dynamics, and the role of knowledge and technology in innovation (Fagerberg et al., 2018). The blue cluster highlights concepts such as *community*, *collaboration*, *empowerment*, *Indonesia*, and *implementation*, indicating that much research focuses on community building, social collaboration, and the Indonesian regional context in the implementation of knowledge-based programs (Putnam, 2000; Prasetyo & Sutopo, 2021). Meanwhile, the green cluster contains keywords such as *study*, *model*, *data*, *analysis*, *effect*, and *relationship* signaling a strong focus on methodological approaches, the use of quantitative data, testing relationships between variables, and empirical models in organizational and management research (Hair et al., 2020). The smaller yellow cluster contains terms such as *sustainable development*, *policy*, *SDG*, and *governance*,

indicating an integration of sustainable development and policy governance themes (Sachs et al., 2019).

Overall, the map demonstrates a strong interconnectedness between clusters in the research landscape on this topic, indicating that innovation, entrepreneurship, community, and sustainability are not separate themes, but rather influence each other and develop in parallel. The dense network in the center of the visualization indicates that core keywords such as *study*, *analysis*, *entrepreneurship*, and *community* act as bridging concepts connecting the various clusters. This demonstrates that the research consistently combines methodological approaches with social and economic contexts to address issues of development, innovation, and organizational change. Thus, this visualization illustrates the evolution of increasingly interdisciplinary research, integrating perspectives from management, public policy, entrepreneurship, and sustainable development within a mutually enriching knowledge ecosystem (Leydesdorff & Milojević, 2022).

The results of the visualization data analysis of the author's collaboration each year with the Waste Management-Based Islamic Social Entrepreneurship Model for Community Empowerment study. Figure 2 shows a visualization that there are 19 groups of construction patterns in the author's collaboration network in the Waste Management-Based Islamic Social Entrepreneurship Model for Community Empowerment study compiled with the VOSViewer application.

Figure 2 displays a map of the author co-authorship network generated through bibliometric analysis using VOSviewer. Each node represents an author, while the lines connecting the nodes depict collaborative relationships based on co-publications. Different colors mark collaboration clusters consisting of authors who frequently engage in joint research or have close research themes. The visualization shows that the collaboration network is formed in several small and medium-sized clusters, each indicating a relatively fragmented research community, where only a subset of authors form a strong collaborative group. Clusters such as those involving authors *Rokhim, R.*, *Raimi*, *Lukman*, *Chovancová*, *Miloslava*, and *Widyanti, N.* indicate a higher intensity of collaboration because their nodes appear close together and have tight connections. This suggests that these authors may be involved in the same research project, the same institution, or focus on interrelated research topics (Katz & Martin, 1997).



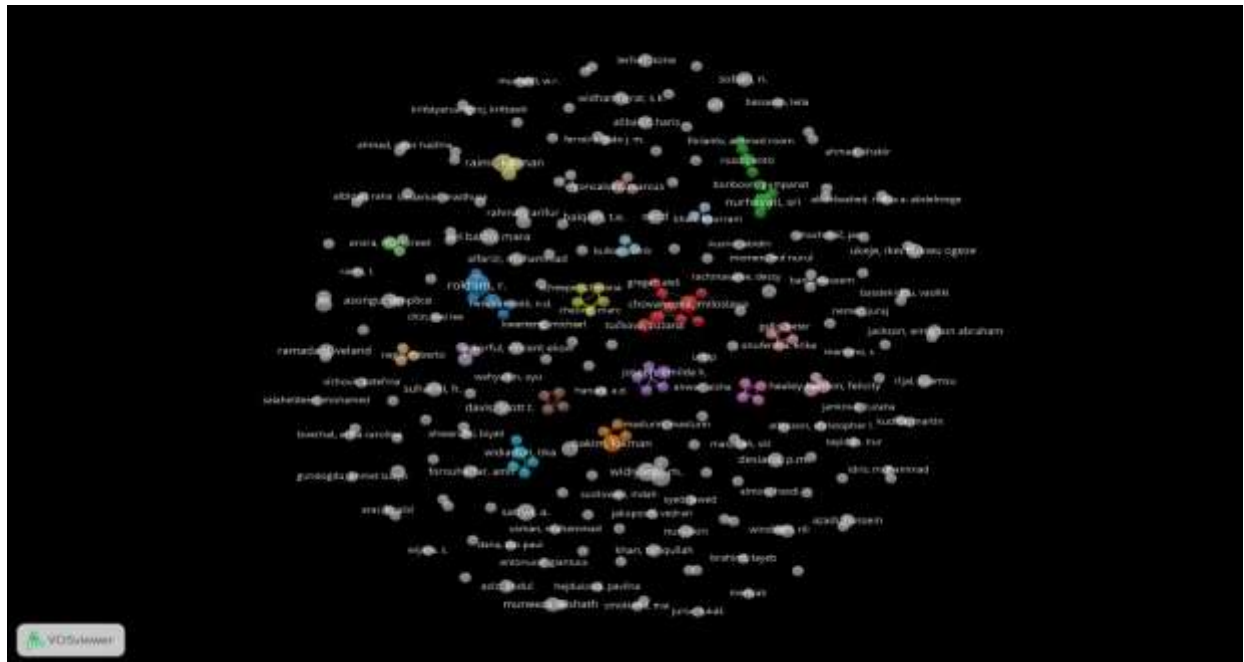


Figure 2: Author Collaboration

Meanwhile, most other authors are more isolated, indicating that they have limited collaborations or work independently. This phenomenon is common in rapidly developing or multidisciplinary research fields, where collaborative networks are fragmented and have not yet formed a strong scientific community (Börner et al., 2010). This network structure also reflects that some authors may act as bridging authors, connecting one cluster to another, who typically make important contributions in integrating different topics or methodologies (Wagner & Leydesdorff, 2005). Furthermore, the less dense distribution of nodes indicates that academic collaboration on the topic under analysis is still sporadic, and that a dominant *research core group* has not yet formed. In the bibliometric literature, this pattern suggests that the field is in a phase of knowledge expansion, where many researchers are just beginning to engage but have not yet established long-term collaborative networks (Glänzel, 2003). Thus, this visualization provides an illustration that the research dynamics are centered on certain authors who are *hubs of collaboration*, while most others are still in weaker collaboration orbits.

The results of data analysis with citation visualization based on the Waste Management-Based Islamic Social Entrepreneurship Model for Community Empowerment Study. Figure 4 depicts the most frequently used article citations based on

international journal sources such as *Encyclopedia of the UN Sustainable Development Goals* , *Encyclopedia of Sustainable Management* , *Technological Forecasting and Social Change* , and *Sustainability* .

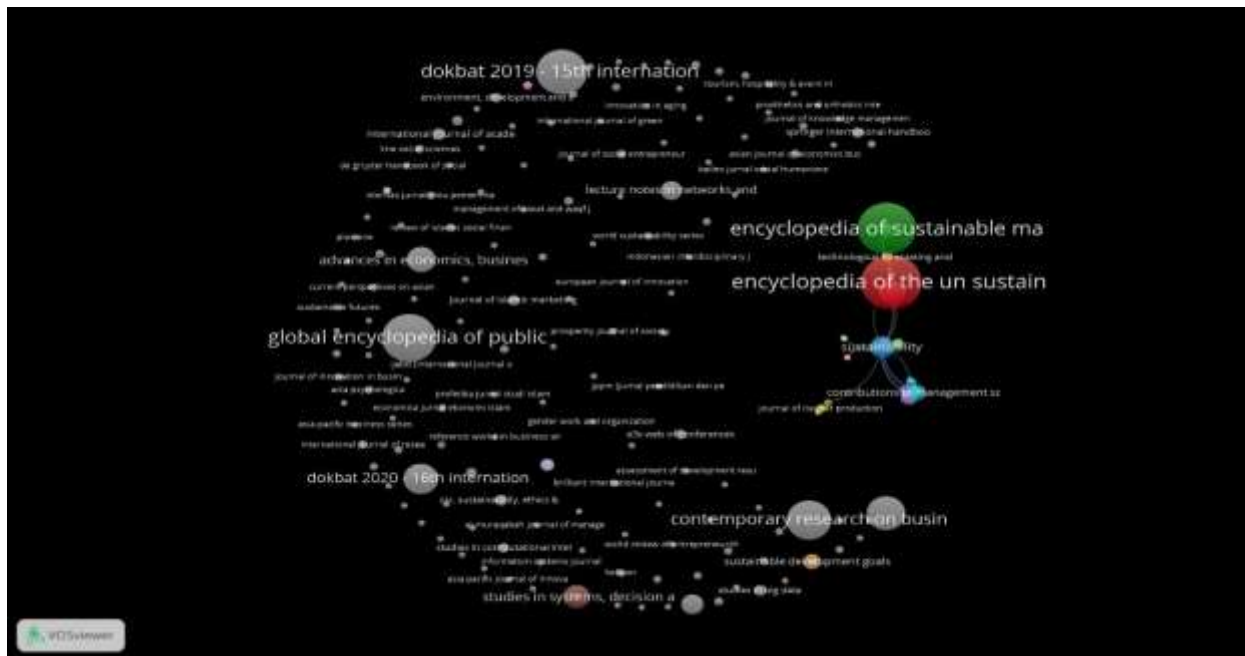


Figure 3: Citation Based on Sources

Figure 3 displays a source co-citation map analyzed using VOSviewer . Each node (circle) represents a scientific source such as a journal, proceedings, handbook, or encyclopedia. The node size reflects the citation frequency, while the color indicates thematic clusters based on the citation relationships between sources. The lines between nodes represent the degree of citation relationship; the thicker the connection, the more closely related the two sources are in the scientific literature. In general, the visualization shows several main clusters:

1. Red Cluster – Key Sources of Sustainability Issues and Global Policies. This cluster features sources such as the Encyclopedia of the UN Sustainable Development Goals, the Encyclopedia of Sustainable Management , Technological Forecasting and Social Change , and Sustainability. The large and central location of these nodes indicates that these sources are **the foundation of the literature** on sustainable development, sustainable management, and organizational transformation in the SDGs

era (Sachs et al., 2019; Barbier & Burgess, 2017). The large size of these nodes indicates that these sources are the most frequently cited and primary references in research on sustainability innovation, policy, and strategic management.

2. Green Cluster – Sustainability Management and Organizational Development.

This cluster includes sources such as: Journal of Cleaner Production, Technological Forecasting & Social Change, and Contributions to Management Science. The relationships between nodes show that this literature serves as an important reference for research using an **interdisciplinary approach** to assess the impact of technology, sustainability strategies, and organizational operational efficiency (Seuring & Müller, 2008).

3. Gray Cluster – Business, Economics, and Academic Conference Research Sources.

Large nodes include: *Global Encyclopedia of Public Administration, Public Policy, and Governance*, *DOKBAT Conference Proceedings*, *Advances in Economics, Business and Management Research*, and *Contemporary Research on Business and Management*. This cluster represents the dominance of conference sources and relevant business analysis in economics, innovation, organizational management, and global market dynamics (Bryson et al., 2020). The numerous connections to these sources demonstrate that business and public administration research provides a theoretical foundation for research related to innovation, technology, and public policy.

4. Small Cluster – Journal Source Related to Innovation, Information Systems, and Islamic Studies.

Around the map are small nodes representing sources such as: Journal of Islamic Marketing, Asia-Pacific Business Series, Journal of Innovation in Business, Studies in Systems and Decisions. These nodes indicate literature contributions from specific domains such as Islamic marketing, digital innovation, and information systems, which contribute to the multi-contextuality of the research (Dwivedi et al., 2015). This visualization shows that the analyzed research relies on major sources related to sustainable development, management, technological innovation, and global policy, while sources from business, economics, and public administration strengthen aspects of regional context and practical implementation. The pattern of connections between sources shows that modern research tends to be interdisciplinary, combining perspectives on public policy, management, innovation, and sustainability. This aligns with the trend of contemporary research that increasingly integrates technological, social,



and environmental perspectives within a single knowledge ecosystem (Leydesdorff & Milojević, 2022).

The results of the visualization data analysis of the author collaboration density each year with the study of Waste Management-Based Islamic Social Entrepreneurship Model for Community Empowerment. Figure 5 shows a visualization that there are 4 dominant authors such as Sri Nurhayati, Lukman Hakim, Josep, and Rokhim, with a construction pattern in the author collaboration network in the study of Waste Management-Based Islamic Social Entrepreneurship Model for Community Empowerment compiled with the VOSViewer application. Figure 5 is an author density visualization generated using VOSviewer. This visualization displays the level of contribution density and author collaboration in a bibliometric network.

The colors on the map indicate the level of activity and frequency of author connections in the literature; yellow indicates areas of highest density (most productive or most cited/connected authors), green indicates medium density, and blue indicates areas of low activity.

1. High Density Points (Yellow). Authors appearing in high density areas are: Nurhayati, Sri, Joseph, Emilda K. Hakim, Lukman , Alblowi, Rana, and Rokhim , R. Their position in the yellow center indicates that these authors: have more publications , are frequently cited, or have strong collaborative relationships in research networks. According to the theory of scientific network analysis, authors with high density tend to be core authors or centers of research communities in a field (Price, 1976; Katz & Martin, 1997). This shows their influence in shaping the direction of the development of research themes.
2. Medium Density Area (Green). Authors such as: Widyanti, M., Chovancová, Miloslava, Hanáková, Lenka, Asongu, Simplicie , and Hoang, Hung Cuong. Located in the green area, which indicates that they have significant contributions but not as intense as the main group. They often act as co-authors who support the development of certain topics, or as authors with cross-cluster connections (Wagner & Leydesdorff, 2005).
3. Low Density Area (Blue). The blue color depicts authors with low connectivity such as: Suhaimi, H., Appiah-Nimo, Christina, Davis, Scott T., Obrecht, Matevž, and Antonucci, Gianluca. These authors may be new, work more independently, or produce publications limited to a particular cluster. *In bibliometrics, this group is classified as*



peripheral authors , whose role is important but not yet a center of collaboration or influence (Glänzel & Schubert, 2004).

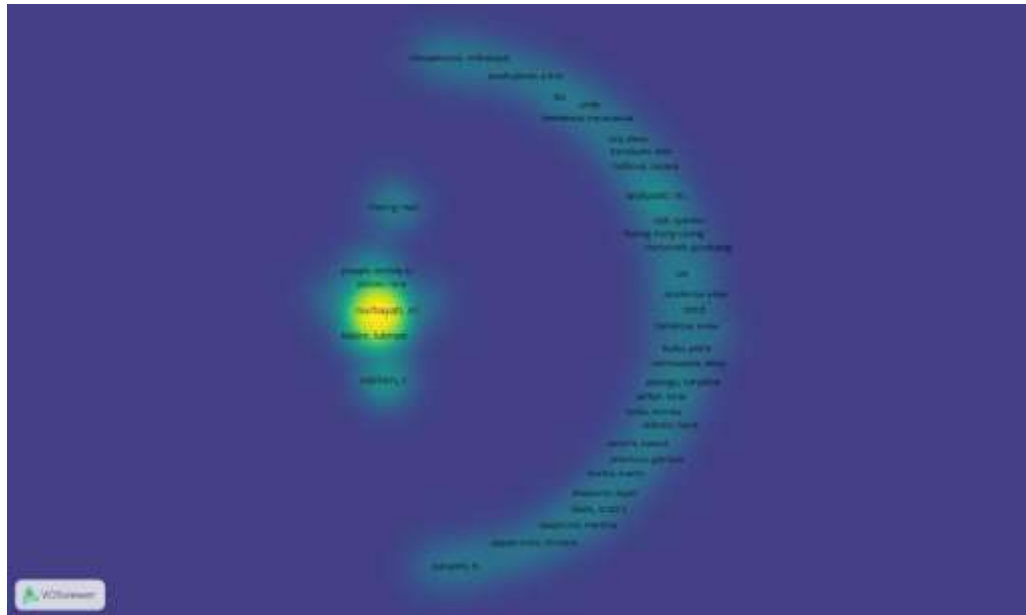


Figure 4: Density Visualization of Bibliometric Coupling Author Collaboration

This density map shows a polarized collaborative structure, with some authors at the center of scholarly activity, while others are scattered in low-density areas. Overall: Key Findings: There is a core collaboration with authors such as *Nurhayati*, *Sri* and *Rokhim, R.* , indicating their dominance in the research themes analyzed. Collaborations are clustered , indicating groups of authors with different thematic focuses but are interconnected. Many authors are located in the blue area, indicating that research is in a phase of fragmentation and growth , where research is still developing and has not yet centered on one dominant school of thought. This pattern is in line with bibliometric literature which states that developing academic fields tend to have heterogeneous and diffuse network structures (Börner et al., 2010).

Results of the analysis of the visualization data of the keyword overlay every year with the Waste Management-Based Islamic Social Entrepreneurship Model for Community Empowerment. Figure 6 shows a map of the keyword co-occurrence network of scientific publications visualized using VOSviewer software. The map displays hundreds of nodes (dots), each representing a keyword in the analyzed article or document. Each line connecting two nodes indicates that the two keywords frequently

appear together in a single document, thus revealing thematic relationships within the collection of publications. The color of the nodes indicates different theme clusters, for example, clusters related to “sustainable development,” “study–analysis–model–data,” “book–chapter–governance,” and so on. The size of the nodes indicates the frequency of keyword occurrence; words such as “study,” “analysis,” “data,” “sustainable development,” and “business” appear larger because they are more frequently used and therefore become core concepts in the field of study.

CONCLUSION

This study underscores that community empowerment through waste management cannot be achieved solely through technical interventions but must integrate social, economic, and ethical dimensions. The bibliometric analysis revealed that while waste management and social entrepreneurship are well-established fields, their integration with Islamic values remains underexplored. This highlights the novelty of framing waste enterprises within the lens of Islamic social entrepreneurship, which aligns sustainable practices with ethical principles such as justice (*adl*), trust (*amanah*), and public good (*maslahah*) (Dusuki & Abdullah, 2007; Ali & Al-Owaihan, 2008). In addition, findings from previous studies confirm similarities in emphasizing the role of participation, leadership, and innovation, but they also reveal differences in approaches—some stressing technical infrastructures, while others focus on social entrepreneurship models. Embedding Islamic perspectives addresses these gaps by providing legitimacy and cultural resonance, particularly in Muslim-majority contexts like Indonesia, where faith-based values strongly influence community behavior (Raharjo et al., 2017; Hidayat & Santoso, 2020). Thus, integrating Islamic principles with social entrepreneurship enhances both economic sustainability and social acceptance of TPS-3R programs.

Ultimately, this research contributes to the literature by proposing a Waste Management-Based Islamic Social Entrepreneurship model that bridges circular economy practices with value-based community empowerment. It offers a pathway for policymakers and practitioners to design more resilient, inclusive, and culturally grounded waste management strategies. Future research should test this conceptual model empirically and longitudinally to assess its long-term impacts on innovation, resilience, and community well-being (Donthu et al., 2021; Geissdoerfer et al., 2017). Bibliometric analysis shows increasing academic attention on waste management, community empowerment, and social entrepreneurship. However, Islamic perspectives remain underrepresented. The proposed model highlights the potential of ISE in enhancing



community empowerment through waste management initiatives. Theoretically, this study extends social entrepreneurship literature by integrating faith-based values. Practically, it provides a framework for policymakers and practitioners to strengthen TPS-3R programs with Islamic ethics, enhancing acceptance and sustainability. Future research should empirically test this model in various contexts to validate its applicability and refine its components.

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