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Planning for Circular Economy Transitions in Emerging Economies: A Systematic Review of Business Model Innovation and Sustainable Development Pathways

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ABSTRACT

Circular economy business model innovation (CEBMI) is gaining global traction as a pathway to sustainable development, but existing frameworks predominantly reflect developed-economy conditions. Emerging economies—characterized by large informal sectors, institutional voids, resource constraints, and infrastructure limitations—face distinct implementation challenges that mainstream CE frameworks fail to adequately address. This study systematically examined how CEBMI manifests and evolves within these contexts. A systematic literature review was conducted following the Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR) protocol by analyzing 58 peer-reviewed publications indexed in Scopus from 2010 to 2024. Bibliometric analysis using VOSviewer examined publication trends, journal co-citation networks, bibliographic coupling, and keyword co-occurrence. Content analysis with high inter-coder reliability (Cohen's $\kappa = 0.87$) determined the implementation patterns and theoretical contributions. Three evolutionary phases were identified as Experimental (2010–2017), Growth (2018–2021), and Maturation (2022–2024), alongside six thematic research clusters. Four characteristics distinguished CEBMI in emerging economies as informal sector integration, institutional void navigation, resource constraint adaptation, and social value creation emphasis. An integrated conceptual framework was proposed comprising the four dimensions, contextual embeddedness, multi-stakeholder value creation, adaptive implementation pathways, and evolutionary growth, offering actionable guidance for practitioners, policymakers, and development organizations to support sustainable CE transitions in emerging economies.

1. INTRODUCTION

The circular economy (CE) represents a transformative approach to sustainable development, departing from the traditional "take-make-dispose" linear economic model [1]. As global challenges of resource scarcity, environmental degradation, and climate change intensify, circular economy business model innovation (CEBMI) has attracted increasing attention worldwide [2].

CEBMI refers to the systematic redesign of organizational value-creation, delivery, and capture mechanisms to incorporate circular economy principles of resource regeneration, waste elimination, and pollution prevention [3]. CEBMI has been widely studied in developed economies, but implementing its principles in emerging economies poses distinct challenges that warrant further investigation [4].

This study defines an emerging economy according to the World Bank classification, which identifies nations with lower gross national income (GNI) per capita, typically including low-income and lower-middle-income economies. These countries often share characteristics relevant to implementing a circular economy, including substantial informal sectors (often exceeding 50% of employment), institutional gaps in regulatory frameworks, significant resource constraints, and infrastructure limitations. This definition encompasses regions across Africa, Asia, and Latin America that face distinct implementation challenges compared to high-income economies.

Focusing on CEBMI in emerging economies is critical because these nations represent the frontier of future resource consumption, with projections indicating that they will account for over 70% of global material consumption by 2050 [5]. However, their governance and market environments differ fundamentally from those assumed by mainstream CE frameworks, with weak enforcement mechanisms, large informal sectors, and capital scarcity shaping how circular approaches must be designed and implemented [6, 7].

CEBMI research draws from multiple theoretical perspectives, including institutional theory, stakeholder theory, resource-based view (RBV), and transition theory, frameworks predominantly developed for developed economies. Theories addressing institutional voids [8],

informal economy dynamics [9], and frugal innovation [10] become increasingly relevant when examining CEBMI in the context of emerging economies.

Despite these robust theoretical foundations, three critical gaps persist when examining CEBMI implementation, specifically in emerging economies.

First, a significant disconnect exists between theoretical frameworks designed for developed economies and the practical realities that firms face in emerging markets [11]. Existing frameworks often assume institutional structures and technological capabilities that may not exist in these contexts. Recent comparative studies — including cross-country analyses of BRICS economies [12] and regional CE assessments across ASEAN [12] confirm that this disconnect is not a minor implementation gap but a fundamental structural divergence that renders developed-economy CE frameworks unreliable guides for emerging-market adoption.

Second, research on how firms successfully innovate their business models while navigating the specific socioeconomic constraints of emerging markets remains limited [13]. This gap is increasingly acknowledged in the most recent literature studies of Africa [14, 15], Latin America [16, 17], and Southeast Asia [18], which consistently identify the absence of BMI-centered frameworks as a critical barrier to CE adoption in their respective regions, underscoring the timeliness and relevance of this study.

Third, current research inadequately addresses context-specific adaptation strategies, informal-sector integration, and social-impact measurement in emerging economies [19]. Cross-regional comparisons in multi-country settings, including China, Finland, and Japan [20], Environmental, Social, and Governance – Circular Economy (ESG-CE) dynamics in emerging markets [21], and CE barriers in Western Balkan transition economies [22] reveal that the absence of context-sensitive frameworks is a persistent and unresolved challenge across developing and transitional economy contexts worldwide.

These research gaps were addressed by conducting a systematic literature review and a bibliometric analysis of CEBMI in emerging economies to answer the following research questions:

RQ1: How has research on CEBMI in emerging economies evolved between 2010 and 2024, and what are the influential contributions shaping this field?

RQ2: What intellectual structures and thematic clusters characterize CEBMI research in emerging economies?

RQ3: What distinctive characteristics differentiate CEBMI implementation in emerging economies from developed economies?

RQ4: What integrated conceptual framework can guide CEBMI implementation in emerging economies?

These four research questions form an intentional, progressive analytical sequence. RQ1 and RQ2 address the structural evolution of this literature: RQ1 examines the temporal and contributory development of the field through performance analysis of publication and citation trends (Sections 3.1 and 3.2), while RQ2 maps the intellectual and thematic architecture of the literature through bibliographic coupling and keyword co-occurrence analysis (Sections 3.3 and 3.4). Building on this foundation, RQ3 moves from structural description to substantive differentiation, using the thematic clusters identified in RQ2 as a basis for content analysis to identify the four distinctive characteristics of CEBMI in emerging economies (Section 3.5). Finally, RQ4 synthesizes the findings from RQ1 to RQ3 into an integrated conceptual framework, translating evolutionary insights, intellectual structures, and implementation characteristics into actionable guidance (Section 3.6). This progression moves from "what the field looks like" (RQ1–RQ2) to "what it reveals about implementation" (RQ3) and, ultimately, to "how it can guide practice and theory" (RQ4).

This study makes three significant contributions to the literature. First, it provides a novel comprehensive bibliometric analysis of research on CEBMI, specifically focusing on emerging economies to reveal the evolution and intellectual structure of this emerging field. Second, through a systematic review, it identifies the distinctive characteristics of CEBMI implementation in emerging economies compared with approaches commonly adopted in developed economies. Third, it proposes an integrated framework that connects contextual factors, implementation approaches, and outcomes, providing both theoretical advancement and practical guidance. Three distinctions set this study apart from previous systematic literature reviews. Existing reviews on circular business models [23, 24] treated emerging and developed economies as comparable implementation contexts, while reviews focusing on emerging markets [25, 26] examined only one CE dimension at a time. Neither applied combined bibliometric mapping and content analysis to a CEBMI-specific corpus, or synthesized the findings into a framework built around the structural realities of developing contexts. The contribution of this study lies in three areas as (i) restricting the corpus to emerging economies, (ii) combining bibliometrics with content analysis, and (iii) producing a framework that treats governance gaps, scarce capital, informal actors, and social value as design imperatives — not peripheral footnotes.

The remainder of this paper is structured as follows. Section 2 outlines the methodological approach. Section 3 presents the results across multiple dimensions and discusses the implications, limitations, and future research directions, with Section 4 drawing pertinent conclusions.

2. METHODOLOGY

This study used a systematic literature review (SLR) and bibliometric analysis to examine circular CEBMI in emerging economies, following the Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR) protocol developed by Paul et al. [27]. This framework was chosen because it effectively combined quantitative bibliometrics with qualitative content analysis, ensuring a comprehensive understanding of the field and providing clear quality criteria, which have been proved effective in sustainability-related fields with successful application in previous studies [28, 29].

2.1 Review protocol

This review followed the Scientific Procedures and Rationales (SPAR-4-SLR) protocol developed by Paul et al. [27] to ensure a rigorous and transparent process. This approach was selected for three key reasons: (1) it combines quantitative bibliometric analysis with qualitative content analysis, providing a comprehensive understanding of the field's intellectual structure and implementation characteristics, (2) it provides a systematic framework for literature evaluation with clear quality criteria, and (3) it has been successfully applied in sustainability-related fields [28, 29]. Table 1 outlines the detailed protocol used in this study.

Table 1. Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR) protocol applied to circular economy business model innovation (CEBMI) in an emerging economy

Aspect	Description
Review protocol	SPAR-4-SLR guidelines [27]
Search mechanism	Scopus database
Search period	January 2010 to December 2024
Search string	TITLE-ABS-KEY (("circular economy" OR "closed loop economy" OR "circularity") AND ("business model*" OR "value proposition" OR "business innovation") AND ("developing countr*" OR "emerging econom*" OR "developing nation*" OR "developing world" OR "third world" OR "low income countr*" OR "middle income countr*" OR "emerging market*" OR "Global South"))
Initial results	96 publications
Organizing criteria	Subject areas, document type, publication stage, language, eligibility, source type
Inclusion criteria	1. Subject areas: "Environmental Science", "Business, Management and Accounting", "Social Sciences", "Engineering", "Energy", "Economics, Econometrics and Finance", "Decision Sciences", "Computer Science", "Physics and Astronomy", "Psychology", "Multidisciplinary", "Mathematics", "Materials Science", "Earth and Planetary Sciences", "Chemical Engineering" 2. Document type: Articles, conference papers, and reviews 3. Publication stage: Final and Article in Press 4. Language: English 5. Eligibility: Full access 6. Source type: Journals and Conference proceedings
Final sample	58 publications
Analytical techniques	1. Performance analysis: Publication and citation metrics 2. Science mapping: Bibliographic coupling, keyword co-occurrence analysis 3. Content analysis: Three-stage process (initial coding, categorization, cross-validation)
Software tools	Microsoft Excel and VOSviewer [30]
Analysis alignment with research questions	RQ1: How has research on CEBMI in emerging economies evolved between 2010 and 2024, and what are the influential contributions shaping this field? → Addressed through performance analysis (publication trends, citation metrics; Section 3.1–3.2) RQ2: What intellectual structures and thematic clusters characterize CEBMI research in emerging economies? → Addressed through science mapping (bibliographic coupling, keyword co-occurrence analysis; Section 3.3–3.4) RQ3: What distinctive characteristics differentiate CEBMI implementation in emerging economies from developed economies? → Addressed through content analysis using thematic clusters from RQ2 as analytical basis (three-stage coding; Section 3.5) RQ4: What integrated conceptual framework can guide CEBMI implementation in emerging economies? → Addressed through integrative synthesis of findings from RQ1–RQ3 into a unified conceptual framework (Section 3.6)
Reporting approach	Integrated visuals (figures and tables) presenting quantitative bibliometric indicators and qualitative thematic findings
Methodological strengths	Transparency, reproducibility, and comprehensive understanding through combined quantitative and qualitative approaches
Limitations	Database coverage, language restrictions to English publications, and bibliometric indicators as proxies for research impact

2.2 Selection process and procedures

The process began with the assembling phase. This established the review domain focused on CEBMI in emerging economies and formulated four guiding research questions. The Scopus database was selected for its comprehensive indexing, and a search string was constructed by combining the three conceptual dimensions as circular economy terminology, business model elements, and emerging economy contexts. The search was bounded from 2010 to 2024, initially yielding 96 publications.

Systematic coding criteria were applied to refine the dataset in the arranging phase. Publications were organized into six dimensions as subject areas, document type, publication stage, language, eligibility, and source type. This refinement process yielded 58 publications that met all the inclusion criteria.

Figure 1 provides a detailed visualization of the study selection process based on the SPAR-4-SLR protocol, including the number of publications at each stage and specific exclusion criteria.

2.3 Analysis methods

The assessing phase evaluated the 58 selected publications using complementary analytical techniques aligned with the four research questions.

2.3.1 Performance analysis

Publication and citation metrics were analyzed to determine research trends and impacts, including annual outputs and citation counts, to identify influential publications and journals.

2.3.2 Science mapping

Bibliographic coupling was used to analyze the relationships among the cited documents and identify intellectual structure, while keyword co-occurrence analysis revealed conceptual structures and significant themes.

2.3.3 Content analysis

The content analysis followed a three-stage process: (1) Initial coding of implementation factors, challenges, approaches, and outcomes, (2) Categorization of codes into themes representing key dimensions of CEBMI implementation, and (3) Cross-validation by two independent researchers with an inter-coder reliability of 0.87 (Cohen's kappa) [31].

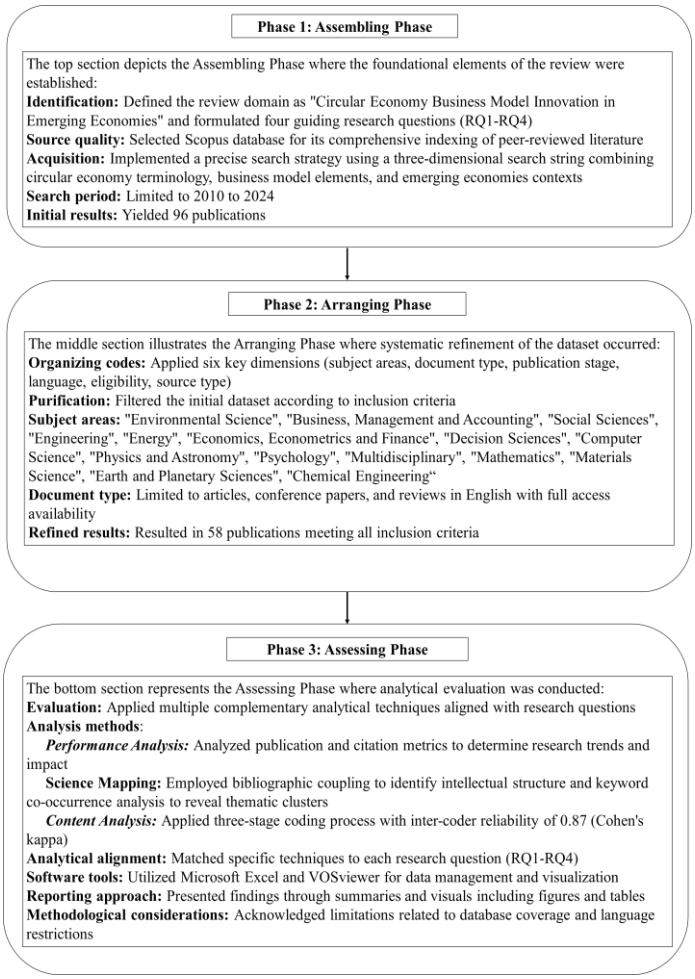

Figure 1. Three-phase methodology for the CEBMI systematic review

2.4 Methodological strengths and limitations

Our methodology offered several strengths, including transparency, reproducibility, and analytical depth. However, important limitations such as publication bias arising from the focus on English-language peer-reviewed literature, potential underrepresentation of specific regions, temporal limitations given the field's recent emergence, and the predominance of qualitative case studies, which limited generalizability, are acknowledged.

3. RESULTS AND DISCUSSION

This section presents the findings from our systematic review and bibliometric analysis to better understand CEBMI in emerging economies. The analysis revealed distinctive patterns in the evolution, intellectual structure, and implementation characteristics of CEBMI research.

3.1 Evolution and circular economy business model innovation publication trends research

Figure 2 shows the annual CEBMI publication trends and citations in emerging economies from 2010 to 2024, revealing distinct patterns in publication frequency and citation impact reflecting the field's maturation.

Three distinct evolutionary phases were identified that characterized the development of CEBMI research in emerging economies; each reflecting different stages of theoretical and practical advancement.

Experimental Phase (2010-2017): This phase emerged with a pioneering publication by Park et al. [32], which established foundational concepts regarding integrating business and environmental value in China's circular economy. This was followed by a 7-year research gap, during which only one study was published in 2017. This pattern reflected the nascent stage of conceptual development, when researchers were still grappling with how to best apply circular economy principles to the unique contexts of emerging economies.

Growth Phase (2018-2021): This period saw substantial expansion in research activity, with the number of publications increasing from 1 in 2017 to 8 in 2021. Citation counts rose dramatically, reaching a peak of 572 in 2020. This growth coincided with the increasing global awareness of circular economy principles, partially accelerated by sustainability concerns during the COVID-19 pandemic. The surge indicated the growing recognition that emerging economies require context-specific approaches to implement a circular economy.

Maturation Phase (2022-2024): This most recent phase has shown continued growth in publication numbers, with 11 publications in 2022, 18 in 2023, and 8 in the first quarter of 2024. Citation numbers declined from the 2020 peak, typical of maturing research fields, where the focus often shifts from establishing foundational concepts to addressing specialized applications and implementation challenges. This evolution mirrored the trajectory observed in developed-economy circular economy research, though with a shorter maturation timeline.

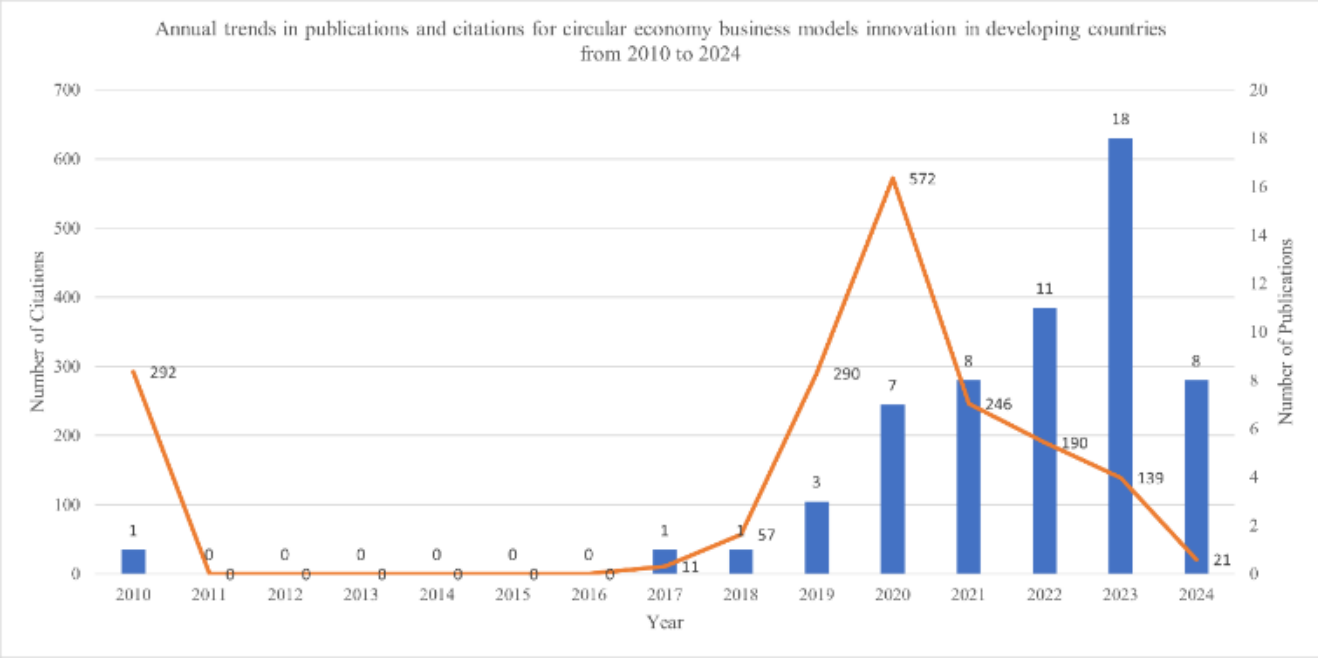

Figure 2. Annual publication and citation trends for CEBMI research in emerging economies, 2010-2024

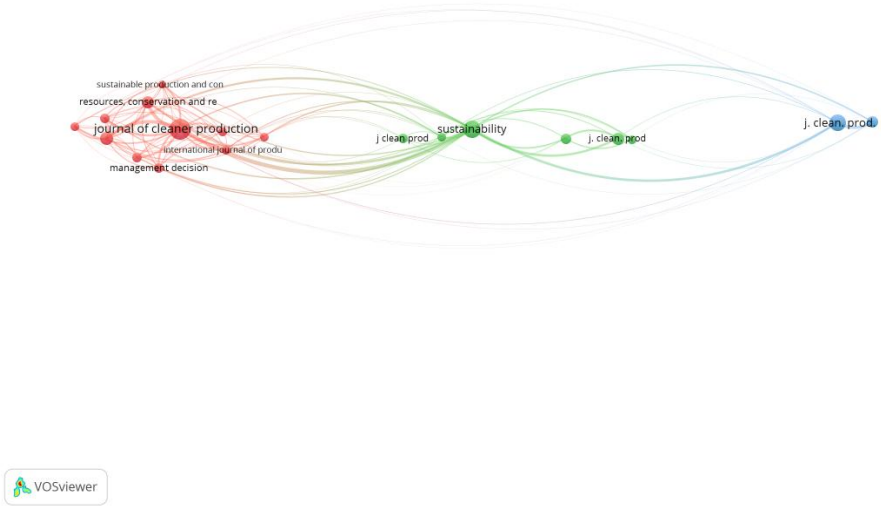

Figure 3. Journal co-citation network: Publication outlets and their relationships in economy business model innovation (CEBMI) research

3.2 Research landscape and influential contributions

Figure 3 illustrates the journal co-citation network for CEBMI research in emerging economies, with results revealing three main clusters that showed how knowledge is produced and disseminated across the field. The dominance of three journal clusters in Figure 3 was significant. The first cluster, centered on the Journal of Cleaner Production and Resources Policy, reflected the foundational role of industrial ecology and resource management theory in shaping how CEBMI has been conceptualized. These journals accept papers that cover engineering-led, material-flow perspectives on economic circularity. Early CEBMI research in emerging economies emphasized manufacturing and resource efficiency (Cluster 2) rather than institutional or social dimensions. The second cluster, anchored by the Journal of Environmental Management and Business Strategy and the Environment, represented the growing influence of institutional theory and stakeholder perspectives, providing the theoretical scaffolding for research addressing governance voids and multi-actor value creation — precisely the dimensions that distinguish CEBMI in emerging economies from developed-economy frameworks. The third cluster, linking Management Decision and the Journal of Business Research, signaled the recent turn toward strategic management and resilience theories, explaining why Clusters 4 and 5 (digital transformation and economic resilience) were the fastest-growing but least-cited areas: they represent the theoretical frontier of the field, where concepts from dynamic capabilities and adaptive strategy are only beginning to be applied to emerging-economy CE contexts. This three-cluster structure reflected a sequential theoretical layering — from industrial ecology to institutional theory to strategic management — that mapped directly onto the three evolutionary phases identified in Section 3.1, with important implications for the future path of theoretical development.

The citation patterns observed in our analysis were contextualized by benchmarking them against average citation rates for sustainability-related publications in the same timeframe. The mean citation count for publications in the circular economy and sustainability fields during 2010-2024 was 45 citations per paper. However, the top five influential papers significantly exceeded this benchmark, averaging 146.6 citations per paper, demonstrating their exceptional impact on the field. This was particularly notable in more recent publications, such as Chiappetta Jabbour et al. [33], which accumulated 259 citations in four years—a rate 5.7 times higher than other publications in this domain.

Table 2 presents the most influential publications in CEBMI research for emerging economies, including their objectives, analytical techniques, and citation metrics. The analysis revealed that Park et al. [32] was the most cited paper, establishing foundational concepts. The papers by Chiappetta Jabbour et al. [33, 34] garnered significant attention within a short period, evidenced by high annual citation counts.

Table 2. Most influential publications in CEBMI research for emerging economies

Rank	Author(s)	Year	Title	Objective	Analytical Technique	Total Citations	Citations per Year
1	Park et al. [32]	2010	Creating integrated business and environmental value within the context of China's circular economy and ecological modernization	Examine how firms can create both business and environmental value in China's CE context	Case study analysis	292	20.86
2	Chiappetta Jabbour et al. [33]	2020	Stakeholders, innovative business models for the circular economy and sustainable performance of firms in an emerging economy facing institutional voids	Examine stakeholder influences on CE business models in emerging economies	PLS-Path Modeling	259	64.75
3	Mishra et al. [35]	2021	Collaboration as an enabler for circular economy: A case study of a developing country	Investigate collaboration as an enabler for CE	Case study analysis	147	29.40
4	Cafforio et al. [36]	2021	Bridging Micro and Macro Perspectives in Circular Business Model Studies: An Integrated Literature Review	Analyze the relationship between Industry 4.0 and CE	Content analysis	124	24.80
5	Chiappetta Jabbour et al. [34]	2020b	First-mover firms in the transition toward the sharing economy in metallic natural resource-intensive industries: Implications for the circular economy and emerging industry 4.0 technologies	Examine implications of sharing economy in resource-intensive industries	Multiple case studies	111	27.75

The distribution of analytical techniques across these influential publications revealed a predominance of qualitative approaches, particularly case studies. This methodological preference reflected the complex, context-dependent nature of CEBMI implementation in emerging economies, where understanding local dynamics and institutional arrangements requires in-depth exploratory research rather than standardized quantitative approaches. The concentration of citation impact in these five publications, which together accounted for 933 citations, or 42% of all citations in the corpus, indicated that the field has not yet achieved theoretical pluralism. The sustained dominance of Park et al. [32] (292 citations, published 2010) signaled that ecological modernization theory remains the foundational lens through which CEBMI in emerging economies is interpreted, while more recent publications have introduced institutional void and stakeholder network perspectives. The rapid citation accumulation of Chiappetta Jabbour et al. [33] (259 citations in four years, compared to 20.86 per year for Park et al.) suggested a theoretical inflection point, with the field actively shifting from an ecology-of-industry framing toward an institutional-stakeholder framing, more suited to the formal-informal hybrid economies characteristic of the emerging-economy context. The predominance of case study methodology across the five top-cited papers was not coincidental but theoretically driven because case studies are the most appropriate method for theory-building in under-theorized contexts. Eisenhardt [37] confirmed that CEBMI in emerging economies remained a theory-development rather than a theory-testing phase, aligning with the broader pattern observed in systematic literature reviews of sustainability management in developing contexts [38], where qualitative approaches dominated until sufficient theoretical consolidation permitted hypothesis-driven quantitative studies.

3.3 Intellectual structure: Bibliographic coupling analysis

Bibliometric analysis to determine "total link strength" represents the cumulative strength of connections between a specific publication or keyword and all other elements in the network. Higher link strength indicates that a publication or concept is more centrally connected to other research in the field. Figure 4 presents the bibliographic coupling network of CEBMI publications in emerging economies, revealing the intellectual structure of the field. The structure of Figure 4 warrants deeper analytical attention. The three patterns in the bibliographic coupling network revealed important theoretical dynamics. First, Cluster 1 (Implementation Barriers and Enablers) achieved the highest total link strength (42) despite not containing the most-cited individual paper. This occurred because Chiappetta Jabbour et al. [33] served as a theoretical bridge between institutional void theory and stakeholder network theory, with its high connectedness reflecting the field's recognition that implementation barriers in emerging economies are fundamentally institutional rather than

technical, a theoretical position that underpins all six clusters to varying degrees. The high link strength of Cluster 1 signals its role as the integrating theoretical core of the network rather than merely a thematic category. Second, the inverse relationship between citation count and link strength Clusters 4 and 5 (Digital Transformation and Economic Resilience) was analytically significant. Arsawan et al. [13] and Alo et al. [39] exhibited high link strength (37 and 34, respectively) relative to their modest citation counts (41 and 22), indicating that these papers were heavily cross-referenced by recent publications, despite not achieving broad citation accumulation. In bibliometric terms, this pattern identified them as "emerging bridges" — papers that are actively reshaping the theoretical conversation without dominating citation counts, consistent with the pattern identified by Wider et al. [40] in science mapping analyses of emerging sustainability research domains. Third, the low link strength of Cluster 6 (Sustainability Integration and Social Impact, maximum 31), despite the thematic importance of social value in emerging economies, reflected the theoretical immaturity of social impact measurement frameworks in CEBMI research — an important gap that our integrated framework addressed through the explicit social value creation dimension.

Table 3 presents the six bibliographic coupling clusters with their respective themes, key publications, citation impact, and total link strength. Each cluster was analyzed to better understand the implications of CEBMI in emerging economies.

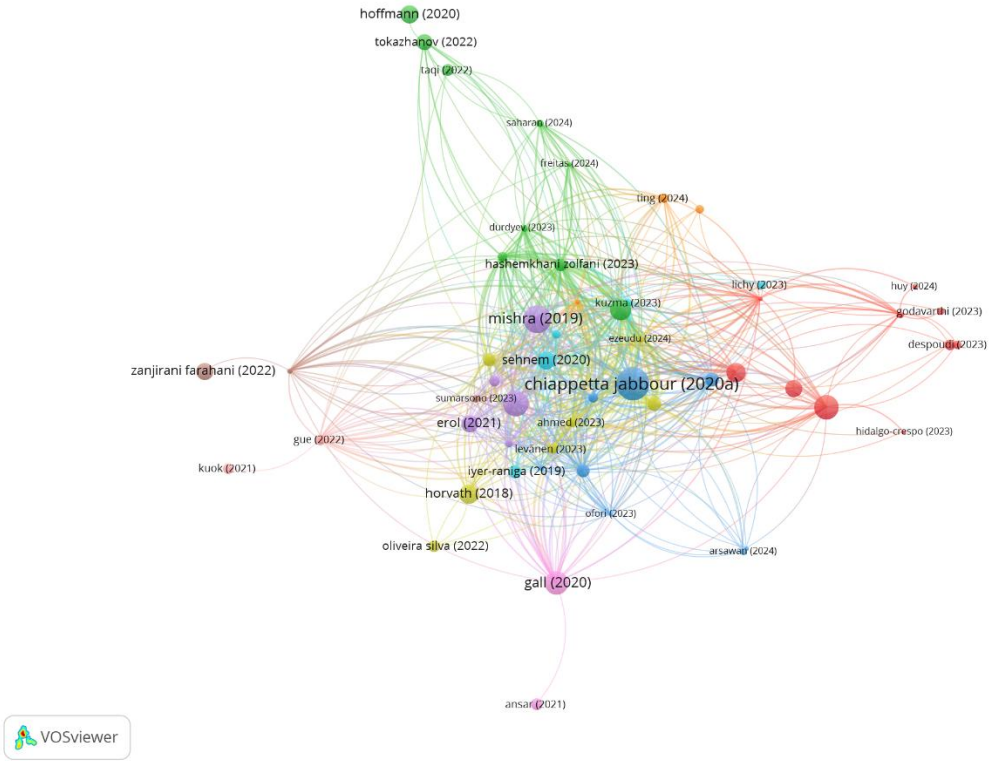

Figure 4. Bibliographic coupling network: intellectual structure and research relationships in CEBMI literature

Table 3. Bibliographic coupling clusters in CEBMI literature

Cluster	Theme	Key Publications	Total Citations	Total Link Strength
1 (Red)	Implementation Barriers and Enablers	[11, 19, 33]	259 73 54	42 36 29
2 (Green)	Manufacturing Contexts and Resource Efficiency	[32, 34, 36]	292 111 124	38 35 33
3 (Blue)	Business Model Innovation and Value Creation	[35, 41, 42]	147 54 57	41 32 28
4 (Yellow)	Digital Transformation and Technological Enablers	[39, 43, 44]	41 23 18	37 33 27
5 (Purple)	Economic Resilience and Adaptive Strategies	[6, 13, 45]	22 17 14	34 30 22
6 (Turquoise)	Sustainability Integration and Social Impact	[46-48]	16 12 50	31 28 24

3.3.1 Cluster 1: Implementation barriers and enablers

This cluster focused on the challenges and facilitators of implementing CEBMI in emerging economies. Chiappetta Jabbour et al. [33] was the most influential publication, examining how stakeholders influence innovative business models in emerging economies with institutional voids. Publications in this cluster emphasized unique implementation barriers, including weak regulatory frameworks, limited financial resources, technological constraints, and key enablers such as stakeholder engagement and organizational capabilities.

Key findings from this cluster highlighted that successful CEBMI implementation in an emerging economy requires navigating multiple interconnected barriers simultaneously rather than addressing them sequentially. For example, Cantú et al. [11] found that Mexican SMEs that successfully implemented circular approaches developed integrated strategies that simultaneously addressed regulatory uncertainties, resource limitations, and stakeholder engagement. This cluster revealed important contextual differences compared to barrier-focused research in developed economies, where implementation barriers primarily involve market dynamics, cost concerns, and organizational culture [2]. By contrast, the barriers in emerging economies are more fundamental, involving infrastructural gaps, institutional voids, and resource constraints that require holistic rather than targeted responses.

3.3.2 Cluster 2: Manufacturing contexts and resource efficiency

This cluster examined the implementation of CEBMI in manufacturing sectors, with a focus on resource efficiency and industrial symbiosis. Park et al. [32] established a framework for integrating business and environmental value in China's circular economy. This cluster focused on how manufacturing firms in emerging economies adopt circular approaches in resource-constrained environments through hybrid strategies that combine selective technology adoption with labor-intensive processes.

One noteworthy finding was the emphasis on "technological leapfrogging," where manufacturers in emerging economies selectively adopt advanced technologies without following the same evolution path as developed economies. Chiappetta Jabbour et al. [34] documented how resource-intensive industries in Brazil implemented specific digital technologies for material tracking while maintaining labor-intensive processing, and achieved efficiency improvements at significantly lower capital costs than comparable operations in developed economies.

3.3.3 Cluster 3: Business model innovation and value creation

This cluster focused on designing innovative circular business models to create multiple forms of value in emerging economy contexts. Circular business models in developed economies typically emphasize product-service systems, sharing platforms, and industrial symbiosis [3], while models thriving in emerging economies tend to focus on community-based collaborative consumption, informal-formal integration platforms, and inclusive value chains.

Horvath et al. [42] documented how plastic recycling firms in Kenya developed hybrid business models that combined elements of traditional recycling with community-based collection systems and micro-entrepreneurship platforms. These models generated significant social value alongside environmental benefits by creating structured engagement mechanisms for informal waste collectors, thereby simultaneously addressing resource recovery and socioeconomic development.

3.3.4 Cluster 4: Digital transformation and technological enablers

Despite infrastructure limitations, this emerging cluster examined how digital technologies enable CEBMI in developing economies. Compared to similar research in developed economies, this cluster placed emphasis on "frugal digitalization" as the selective application of digital technologies with minimal resource requirements. Unlike comprehensive digital transformation approaches common in developed economies, research in this cluster focused on targeting technological interventions that addressed specific bottlenecks.

One critical distinction within this cluster was how digital tools were embedded within business model redesign rather than merely process optimization. Alo et al. [39] documented how used automotive parts dealers in Africa developed circular business models that combined digital communication platforms with revalorization networks, enabling informal traders to access formal markets while preserving their community-based operating logic. In these models, digital technology served as an enabler of business model architecture rather than a substitute. Yordanova and Shotarov [43] also introduced the concept of “digital resource leverage,” showing how social entrepreneurs in resource-constrained contexts transform digital scarcity into a circular business model opportunity by designing service offerings that convert connectivity limitations into community-based value exchange mechanisms. These studies demonstrated that CEBMI in emerging economies produced distinctive digital business model configurations that differed fundamentally from the process-automation focus of Industry 4.0 literature developed in high-income contexts.

3.3.5 Cluster 5: Economic resilience and adaptive strategies

This recent cluster focused on how circular business model configurations enhanced economic resilience, particularly during global disruptions. Research in developed economies typically positions circularity as an environmental strategy with economic co-benefits, but this cluster framed circular business model architectures primarily as resilience strategies with environmental co-benefits. Prosman et al. [44] provided direct evidence from business model design, documenting how third-party loop operators developed activity-based circular business models that generated resilience by closing resource loops for multiple upstream firms simultaneously. This created inter-firm interdependencies that buffered against individual supply chain disruptions while generating new revenue streams through material recovery services. From this business-model-level contribution, resilience did not emerge from operational adaptation within existing models, but from the architectural redesign of how value was created, delivered, and captured across interconnected actors.

Research in this cluster also underscored the importance of flexible implementation approaches that can adapt to shifting economic conditions. van Rooyen et al. [45] documented how agricultural circular initiatives in Sub-Saharan Africa incorporated deliberate modularity in their implementation that allowed scaling back during economic downturns while preserving core circular practices.

3.3.6 Cluster 6: Sustainability integration and social impact

This cluster examined the social dimensions of CEBMI and integration with broader sustainability goals in emerging economies. This cluster was distinguished from comparable research in developed economies by the explicit emphasis on social impact as a primary rather than secondary outcome. Circular economy research in developed countries typically positions social benefits as positive externalities of environmental initiatives, but this cluster documented approaches that were deliberately designed for social impact alongside material circularity.

One significant finding from this cluster was that social impact considerations often drive adoption in emerging economies, whereas environmental considerations typically drive adoption in developed economies. Sehnem et al. [48] found that wine producers in Brazil adopted circular practices primarily for positive community impacts and secondarily for environmental benefits, representing an important motivational distinction from similar initiatives in developed wine regions.

3.3.7 Cross-cluster synthesis: Critical comparison, shared patterns, gaps, and open-ended questions

Reviewing the six clusters individually was insufficient without a critical cross-cluster comparison that identified the structural patterns, tensions, and persistent gaps that spanned the entire CEBMI literature in emerging economies. Our synthesis revealed three cross-cutting findings and four open-ended questions that individual cluster reviews did not expose. The first cross-cutting finding concerned the shared mechanism of informal-formal integration. All of the six clusters revealed that effective CEBMI in emerging economies required some form of structured engagement between formal economic actors and informal networks. Clusters 1 and 3 documented this through barrier navigation and inclusive business model design, respectively, Cluster 2 through hybrid production systems, Cluster 4 through low-infrastructure digital solutions, Cluster 5 through community-based resilience, and Cluster 6 through social-first adoption motivations. This convergence across otherwise distinct research domains was theoretically significant because it suggested that informal-formal integration was not a context-specific feature of any single CEBMI approach but a structural prerequisite of all CEBMI pathways in emerging economies. This finding had direct implications for the framework proposed in Section 3.6, where Contextual Embeddedness was positioned as the foundational dimension because it captured this universal integration requirement [49, 50]. The second cross-cutting finding concerned diverging theoretical emphasis between older and newer clusters. Clusters 1, 2, and 3 (the most cited and oldest) were primarily grounded in institutional theory, stakeholder theory, and resource-based frameworks, while Clusters 4, 5, and 6 (lower-cited but higher link strength) drew more heavily on dynamic capabilities, resilience theory, and social innovation perspectives. This theoretical divergence signaled a maturation trajectory, with the field progressively moving from descriptive barrier-mapping toward explanatory models of capability development and systemic transition, as confirmed by recent research agendas on CE adoption in SMEs [51] and circular entrepreneurial ecosystems [52]. The third cross-cutting finding concerned asymmetric geographic representation. The dominant cases across all the clusters were from Brazil, India, China, and Kenya, with Sub-Saharan Africa (other than Kenya), Southeast Asia, and the Middle East substantially underrepresented despite comprising large shares of global emerging-economy activity. This geographic concentration created a risk of overgeneralizing the findings from specific national and regional institutional contexts — particularly since institutional void patterns, informal sector structures, and regulatory environments differed substantially across these regions [53, 54]. Four open-ended questions emerged from this cross-cluster comparison that the existing literature did not adequately address. First, what are the conditions under which CEBMI implementation can transition from cluster-specific approaches (e.g., manufacturing-focused or resilience-focused) to integrated multi-cluster approaches that operate simultaneously across several CEBMI dimensions. Current research treated the clusters as independent domains, but circular economy transitions in practice require their co-deployment — a design challenge that the literature on smart circular economies in South Asia [53] and ecosystem missing links [55] are only beginning to address. Second, which cluster-specific CEBMI approaches are scalable beyond their original organizational or geographic context, and what institutional conditions are necessary for scaling. Research on upscaling niche circular innovations [56] identified this as a central gap. Most documented cases were at SME or local community scales, and the transition mechanisms to sectoral or national scales remain poorly understood. Third, what measurement frameworks are adequate for capturing the multi-dimensional value creation (economic, environmental, and social) that the literature consistently identifies as distinctive to CEBMI in emerging economies. The absence of standardized measurement approaches was noted across Clusters 1, 3, and 6 as a critical barrier to cross-study comparison and policy-relevant evidence generation. Fourth, how do the cluster-specific enablers and barriers interact when multiple CEBMI dimensions are pursued simultaneously. Clusters 1 through 6 identified distinct drivers and obstacles, but with no systematic analysis of how, for example, digital transformation enablers (Cluster 4) interact with social-impact imperatives (Cluster 6) or how resilience strategies (Cluster 5) modify the institutional void navigation challenges of Cluster 1. This systemic blind spot must be addressed to move the field from cluster-specific insights to an integrated understanding of CEBMI implementation pathways in emerging economies [57, 58].

3.4 Thematic focus through keyword co-occurrence

Figure 5 presents the keyword co-occurrence network for CEBMI research in emerging economies, revealing the conceptual structure and thematic focus of the study. This visualization revealed the central position of "circular economy" as the core concept, with six interconnected thematic clusters focusing on implementation barriers, manufacturing contexts, business model innovation, digital transformation, economic resilience, and sustainability integration. Table 4 presents the six keyword co-occurrence clusters, along with their respective themes, key keywords, frequency of occurrence, and total link strength.

The thematic analysis through keyword co-occurrence confirmed the patterns identified in the bibliographic coupling analysis, demonstrating the emerging research directions, particularly in digital transformation and economic resilience, that distinguished CEBMI research in emerging economies from that in developed contexts. Three specific features of

Figure 5 and Table 4 were selected for further analytical interpretation. First, the extreme centrality of "circular economy" (occurrence: 37, link strength: 38) relative to all the other keywords —appearing nearly ten times more frequently than the next most common substantive keyword — was theoretically meaningful rather than trivially descriptive. This asymmetry indicated that CEBMI research in emerging economies lacked mature mid-level theoretical constructs, with the field converging on the CE concept without developing a settled vocabulary of context-specific mechanisms. This contrasted with the pattern observed in more mature sustainability research domains, where mid-level concepts (e.g., "dynamic capabilities," "institutional voids") achieved comparable keyword frequencies to core concepts [59, 60]. Thus, the field requires the framework proposed in Section 3.6 to provide shared conceptual vocabulary at the mid-level of abstraction. Second, the high link strength of "sustainability" in Cluster 6 (15) — the highest of any non-circular economy keyword — combined with its co-occurrence with "innovation" (3) rather than "social impact" or "poverty reduction" revealed a theoretical tension. The empirical evidence in Sections 3.3.6 and 3.5 suggested that social value drives adoption in emerging economies more strongly than in developed ones, but the keyword network did not produce a corresponding theoretical vocabulary for social value in CE contexts. This gap between the empirical findings and theoretical codification should be addressed by future research. Third, the presence of "DEMATEL" as a recurring keyword in Cluster 1 (occurrence: 2, link strength: 3) was theoretically instructive. DEMATEL is a multi-criteria decision-making method used to map causal relationships among implementation barriers. Our results indicated that a subset of CEBMI research in emerging economies is moving toward causal modeling of implementation pathways — a methodological development suggesting that the field is beginning to enter the theory-testing phase, as also noted in resilience-focused integrative reviews [61].

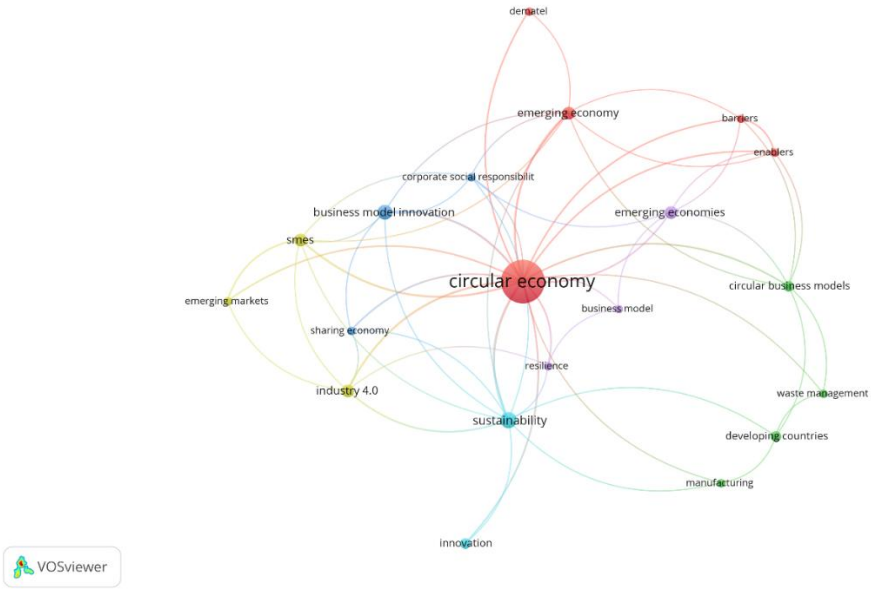

Figure 5. Keyword co-occurrence network for CEBMI research in emerging economies

Table 4. Keyword co-occurrence analysis

Cluster	Thematic Focus	Key Keywords	Occurrence	Total Link Strength
Cluster 1: Implementation and Barriers	Focus on implementation challenges and factors enabling CEBMI	circular economy	37	38
		emerging economy	4	11
		barriers	2	7
		enablers	2	7
		dematel	2	3
Cluster 2: Manufacturing and Development Context	Emphasis on operational contexts in emerging economies	circular business models	3	8
		emerging economy	3	4
		waste management	2	3
		manufacturing	2	3
Cluster 3: Business Model Innovation and Social Responsibility	Focus on innovative business approaches with social considerations	business model innovation	5	8
		corporate social responsibility	2	6
		sharing economy	2	5
Cluster 4: Digital Transformation	Emphasizes technological integration in emerging markets	SMEs	4	10
		industry 4.0	4	9
		emerging markets	2	5
Cluster 5: Economic Resilience	Addresses resilience aspects in emerging economies	emerging economies	4	7
		resilience	2	5
		business model	2	3
Cluster 6: Innovation and Sustainability	Links sustainability practices with innovation	sustainability	6	15
		innovation	3	3

The bibliometric clusters and keyword patterns generated three aggregated theoretical implications that transcended single clusters and pointed toward the development direction of CEBMI theory. First, the combined evidence from Sections 3.3 and 3.4 indicated that CEBMI in emerging economies was characterized by "institutional bricolage": firms do not simply adapt existing CE frameworks to resource-constrained contexts, but actively construct novel institutional arrangements, stakeholder networks, and resource combinations that have no direct counterpart in developed-economy CE practice. This is not a deficiency but a distinctive theoretical contribution — the field is generating original institutional solutions that extend rather than merely apply existing theory [62, 63]. Second, the consistent finding across all clusters that social value is a co-primary rather than secondary strategic objective in emerging-economy CEBMI challenges the implicit theoretical hierarchy of most CE frameworks, which place environmental and economic values above social value in their design logic. This inversion has implications for how CE performance should be measured, how stakeholder priorities should be weighted in business model design, and how policy frameworks should be structured to support CE adoption — implications that the literature has identified but not yet translated into revised theoretical models or measurement instruments. Third, the co-occurrence of high link strength keywords such as "sustainability" and "industry 4.0" with low-frequency occurrence terms such as "emerging markets," "barriers," and "resilience" revealed that the CEBMI field in emerging economies remains at the intersection of multiple theoretical traditions without achieving synthesis. The field simultaneously draws on industrial ecology, institutional theory, strategic management, and social innovation — but has not yet developed integrative mid-level constructs that connect these traditions in a coherent theoretical architecture. This motivated the integrated framework proposed in Section 3.6, designed to provide that missing synthesis, by specifying the hierarchical causal relationships among the theoretical perspectives rather than treating them as parallel contributions [64, 56].

3.5 Comparative analysis and distinctive characteristics of circular economy business model innovation in emerging economies

Our bibliometric and content analyses identified significant differences in CEBMI implementation between developed and emerging economies across multiple dimensions, as summarized in Table 5.

Table 5. Comparative analysis of CEBMI implementation characteristics

Dimension	Developed Countries	Emerging Economy	Example Studies
Implementation Drivers	Regulatory pressure and consumer demand	Resource necessity, social needs, and informal sector integration	[33, 42]
Value Creation Focus	Environmental and economic benefits prioritized	Triple-bottom-line values are integrated more equally	[46, 48]
Stakeholder Engagement	Focus on formal stakeholders (businesses, regulators, customers)	Includes informal sector actors and community organizations	[65, 66]
Resource Approach	Technology-intensive approaches	Hybrid approaches combining selective technology adoption with labor-intensive processes	[6, 36]
Implementation Pathways	Top-down regulatory compliance	Bottom-up experimentation and cross-sector collaboration	[11, 35]

This comparative analysis provided a foundation for understanding the implementation of CEBMI in emerging economies and revealed four distinctive characteristics that differentiated it from patterns observed in developed economies.

3.5.1 Informal sector integration

The informal sector constitutes over 50% of economic activity and waste management operations in emerging economies [65, 67], compared to typically less than 10% in developed economies. CEBMI in developed nations generally operates through formalized waste management systems, with the successful implementation of government oversight and corporate-led initiatives in emerging economies critically dependent on integration with informal sectors. Effective circular business models in emerging economy contexts incorporate informal waste collectors and community networks as essential partners in the value chain.

For example, in Kenya, Horvath et al. [42] documented how plastic recycling companies achieved higher collection rates and improved material quality by formally partnering with informal waste picker associations, providing them with training, equipment, and fair pricing. The Saahas Zero Waste initiative has also been established as a successful circular business model in India by formalizing contracts with over 2,000 informal waste collectors, increasing their incomes by 25% while achieving a 90% waste diversion rate [35].

This characteristic extends stakeholder theory by challenging traditional power-legitimacy-urgency frameworks [68] that classify informal actors as "latent" or "discretionary" stakeholders. Our findings suggested that informal actors possessed critical resources and capabilities essential to CEBMI success, despite lacking formal power and legitimacy, thereby repositioning them as "definitive" stakeholders central to value creation.

3.5.2 Institutional void navigation

CEBMI in emerging economies operates under pronounced institutional voids, including absent or weakly-enforced regulations, limited contract enforcement, and fragmented market-supporting services. In developed economies, regulatory pressure typically drives circular adoption. In Thailand, however, firms cannot rely on these levers, and successful adopters have to construct their own governance arrangements through industry associations, multi-stakeholder networks, and co-designed standards to fill the gaps left by formal institutions.

Chiappetta Jabbour et al. [33] demonstrated that Brazilian

manufacturing firms created multi-stakeholder governance platforms to establish shared quality standards, verification processes, and dispute-resolution mechanisms in the absence of effective government regulations. This characteristic extended institutional theory by demonstrating how firms in emerging economies actively construct alternative institutional arrangements rather than merely responding to institutional pressures.

3.5.3 Resource constraint adaptations

CEBMI in emerging economies demonstrates distinctive adaptations to resource limitations that manifest specifically at the business model level rather than at the process level. Successful models employ bricolage and frugal innovation as business model design principles, reconfiguring available resources into novel value-creation architectures. Dost et al. [6] provided direct evidence from Malaysia, documenting how emerging-market firms, implementing circular approaches through entrepreneurial bricolage, developed distinctive business model configurations, specifically as value propositions built around the revalorization of materials discorded by resource-rich competitors and delivered through stakeholder networks that converted informal sector actors into formal supply chain partners. This demonstrated business model innovation in the strict sense, not process efficiency improvement, and fundamentally redesigned value proposal, creation, and capture. In the same vein, Phuthong [69] developed a CEBMI framework specifically for community enterprises processing agricultural waste in Thailand, demonstrating how resource-constrained organizations in the Global South constructed viable circular business models by embedding social value creation into the core of their value architecture rather than treating it as a peripheral sustainability objective.

This characteristic extended the resource-based view by reconceptualizing resource constraints as potential sources of distinctive capabilities and competitive advantage. The traditional RBV focuses on the strategic value of resource abundance, but our findings highlighted how scarcity can drive innovative approaches to resource utilization, creating unique capabilities that are difficult for resource-rich competitors to replicate.

3.5.4 Social value creation emphasis

CEBMI in developed economies primarily emphasizes environmental and economic benefits, but successful models in emerging economies explicitly integrate social value creation as a core strategic element rather than a peripheral consideration. Chineme et al. [46] demonstrated how women-led recycling enterprises in Nigeria designed business models that explicitly targeted employment creation for marginalized groups while achieving environmental goals.

This characteristic extended the triple bottom line theory by elevating social outcomes from peripheral considerations to core strategic elements. In an emerging economy, social value creation is crucial to the successful implementation of CEBMI, requiring the development of expanded theoretical models that explicitly incorporate social impact dimensions that resonate with environmental and economic factors.

3.6 Integrated framework for circular economy business model innovation in emerging economies

Based on our comprehensive analysis, an integrated conceptual framework for CEBMI in emerging economies was proposed (Figure 6). This framework synthesized the distinctive characteristics identified in our analysis and illustrated the dynamic interplay among contextual factors, implementation approaches, and outcomes that were unique to emerging economy environments.

3.6.1 Theoretical foundations of the framework

Our integrated framework synthesized four theoretical perspectives, particularly relevant to emerging economy contexts, as (1) Institutional void theory [8] that informs the contextual embeddedness dimension, highlighting how firms must navigate gaps in regulatory frameworks and formal institutions, (2) Stakeholder network theory [70] that underpins the multi-stakeholder value creation dimension, emphasizing the complex interconnections between formal and informal actors, (3) Resource orchestration theory [71] that supports the adaptive implementation pathways dimension, explaining how firms can create value despite resource constraints, and (4) Evolutionary capabilities perspective [72] that grounds the evolutionary development dimension, documenting how organizational capabilities develop incrementally over time. These four theories are not parallel or interchangeable. They operate at different levels of analysis and are connected through a specific causal logic that reflects the progressive challenges firms face when implementing CEBMI in emerging economies. The hierarchical relationships among these theories are as follows. Institutional void theory operates at the foundational level, establishing the constraints within which all other theoretical mechanisms must function. Firms in emerging economies cannot rely on formal governance structures, contract enforcement, and regulatory infrastructure assumed by most mainstream business model frameworks, with institutional voids defining the boundary conditions for all subsequent decisions [73, 74]. This foundational constraint structurally distinguishes CEBMI in emerging economies from developed-economy counterparts and justifies the Contextual Embeddedness dimension as the base layer of the framework. Building on this institutional foundation, stakeholder network theory operates at the relational level, explaining how firms respond to institutional voids by constructing alternative governance arrangements through multi-actor collaboration. Chiappetta Jabbour et al. [33], Sahu and Choudhary [75] found that when formal institutions are absent in agricultural CE transitions, stakeholder networks serve as a functional substitute — providng the shared standards, trust mechanisms, and coordination structures that markets and regulators would otherwise supply. Stakeholder theory thus translates institutional constraints into an actionable relational strategy, with the Multi-stakeholder Value Creation dimension logically following and depending on the Contextual Embeddedness dimension. Once the relational architecture has been established, resource orchestration theory operates at the firm capability level, addressing how organizations strategically acquire, accumulate, and deploy resources despite the constraints identified at the institutional and relational levels. Drawing on Sirmon et al.'s [71] resource orchestration framework and extending to CE contexts [76] in developing-economy SMEs, this theory explains why effective CEBMI requires possessing resources and then actively bundling and leveraging them across the three pathways — informal integration, institutional development, and frugal innovation — that constitute the Adaptive

Implementation Pathways dimension. Resource orchestration thus converts the relational capital generated through stakeholder networks into implementable circular strategies. Finally, the evolutionary capabilities perspective operates at the temporal level, explaining how the institutional navigation, relational investments, and resource orchestration activities described by the first three theories accumulate into organizational capabilities over time. Chizaryfard et al. [77] and Schaltegger et al. [78] found that CE transformation in emerging economies is a path-dependent, co-evolutionary process in which each stage of capability development builds on organizational learning from previous stages, and is captured by the Evolutionary Development dimension through its four sequential stages of resource efficiency, value chain reconfiguration, business model innovation, and systemic transformation. The four theories form a nested, hierarchical causal chain, with institutional constraints defining the operating environment (institutional void theory), stakeholder networks providing the governance substitute (stakeholder theory), resource orchestration converting relationships into implementation capability (resource orchestration theory), and evolutionary development explaining how these capabilities accumulate into sustainable competitive advantage over time (evolutionary capabilities perspective). Each theory addresses a different causal question. Specifically, what are the constraints, how are they governed, how are resources deployed, and how do capabilities evolve. Each answer presupposes the preceding one, creating a genuinely integrated rather than parallel theoretical architecture [79, 80].

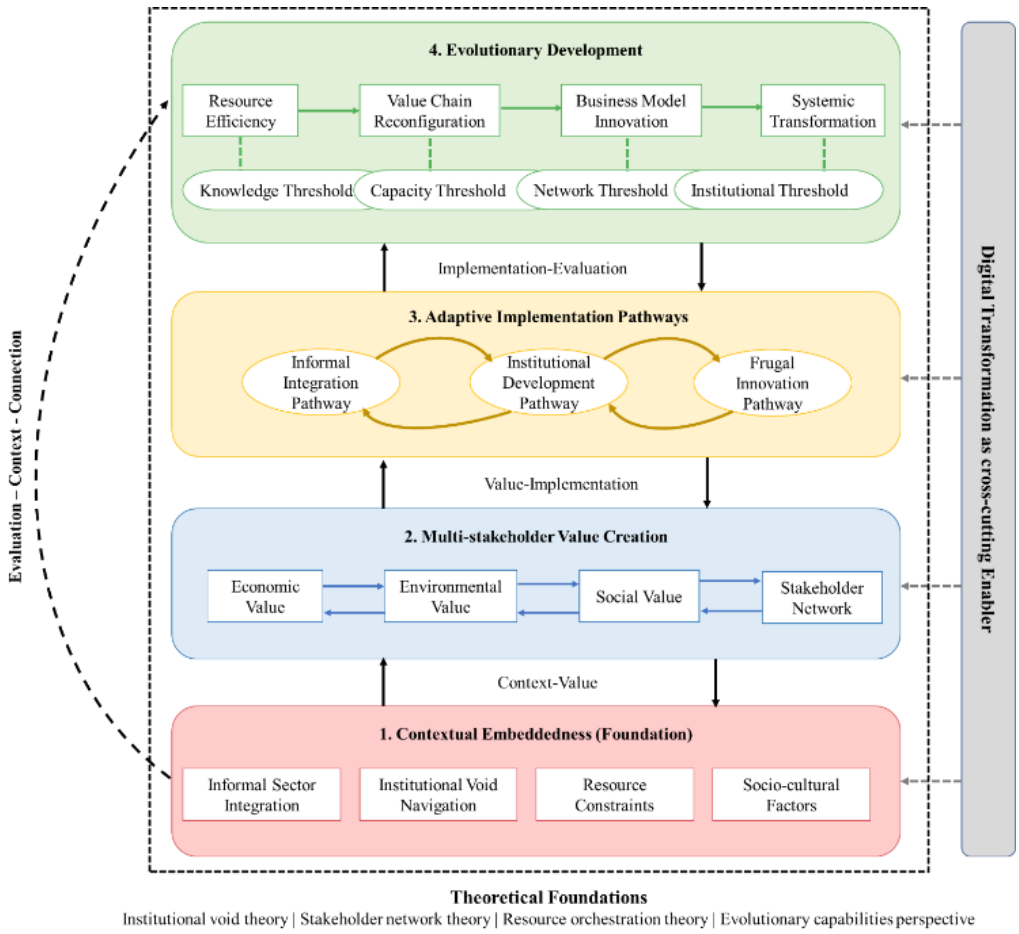

Figure 6. Integrated framework for CEBMI in emerging economies

3.6.2 Framework structure and components

Unlike previous frameworks that predominantly assume institutional structures, resource availability, and formalized economic systems characteristic of developed economies, our framework explicitly addressed the unique challenges and opportunities in emerging economy contexts. The framework consisted of four interconnected dimensions arranged in a hierarchical cyclical structure.

Contextual Embeddedness (Foundation): At the foundation of our framework, contextual embeddedness recognizes that circular business models must be deeply rooted in local realities. This foundational dimension encompasses informal-sector integration, navigating institutional voids, resource constraints, and socio-cultural factors.

Multi-stakeholder Value Creation: Building on contextual embeddedness, successful CEBMI in an emerging economy must create and balance multiple forms of value as economic value (revenue generation, cost reduction), environmental value (resource conservation, waste reduction), social value (employment creation, poverty reduction), and value creation across a diverse stakeholder network.

Adaptive Implementation Pathways: Informed by contextual factors and value-creation objectives, three implementation pathways emerged as particularly effective, including the informal integration pathway, the institutional development pathway, and the frugal innovation pathway.

Evolutionary Development: The framework conceptualized CEBMI implementation as an evolutionary process, typically progressing through sequential stages, resource efficiency, value chain reconfiguration, business model innovation, and

systemic transformation.

3.6.3 Digital transformation as a cross-cutting enabler

Our analysis identified digital transformation as a crucial, cross-cutting element that influenced CEBMI implementation across all dimensions. Digital technologies function as a transversal element that influences each framework dimension differently. For contextual embeddedness, digital technologies enable formal businesses to connect with informal sector actors despite infrastructure limitations. To create value for multiple stakeholders, digital applications enhance transparency and trust among diverse actors. For adaptive implementation pathways, digital platforms facilitate knowledge sharing and collaborative innovation. For evolutionary development, simple data analytics support evidence-based decision-making and continuous improvement.

3.6.4 Dynamic interrelationships and feedback loops

A distinctive feature of our framework was the emphasis on dynamic interrelationships between dimensions. The cyclical arrangement of these connections highlighted the iterative nature of CEBMI implementation, with outcomes feeding back into contextual factors and shaping future approaches. This dynamic perspective represented a significant advancement over existing frameworks that typically present circular business models as fixed archetypes or typologies. More specifically, the feedback loops in the framework mapped directly onto the inter-theory relationships articulated in Section 3.6.1 and could be traced through four cross-level mechanisms. First, the downward feedback from Evolutionary Development to Contextual Embeddedness indicated that as firms progressed through evolutionary stages and developed stronger institutional navigation capabilities, they altered the institutional environment itself — formalizing previously informal relationships, co-creating industry standards, and building regulatory capacity — thereby modifying the very institutional voids that originally constrained them. This mechanism concurred with institutional entrepreneurship theory and was documented in the recycling sector by Daou et al. [73], who noted that organizations that successfully navigated institutional voids eventually shaped new institutional arrangements for the wider industry. Second, the lateral feedback from Adaptive Implementation Pathways back to Multi-stakeholder Value Creation indicated that as firms developed their resource orchestration capabilities through repeated implementation cycles, they attracted new stakeholder categories, unlocked new forms of value, and reconfigured stakeholder network architecture. Dost et al. [6] demonstrated this mechanism in emerging-market CE implementation, where bricolage and frugal innovation activities iteratively expanded stakeholder networks as new resource combinations proved viable. Third, the upward feedback from Multi-stakeholder Value Creation to Contextual Embeddedness demonstrated that successful multi-stakeholder value creation reduced institutional voids by providing proof-of-concept evidence that lowered the uncertainty for subsequent adopters and attracted supportive policy attention, gradually shifting the institutional context from constraining to enabling. Fourth, the cross-cutting role of digital transformation (Section 3.6.3) operated as an amplifying mechanism across all feedback loops, compressing the time required for each cycle and broadening the geographic reach of institutional entrepreneurship, stakeholder network effects, and evolutionary capability accumulation, consistent with the findings of Sadiq et al. [81] on digital platforms as institutional support mechanisms in CE adoption in Cambodia and Vietnam. Taken together, these four feedback mechanisms indicated that the framework's cyclical structure was not merely a visual device but reflected a theoretically grounded model of how institutional constraints, relational capital, resource capabilities, and evolutionary learning interacted and mutually reinforce each other over the trajectory of CEBMI implementation in emerging economies [82].

3.6.5 Comparison with existing frameworks

Our integrated framework made several distinctive contributions compared to existing CEBMI frameworks. Previous frameworks such as the ReSOLVE Framework [83], Sustainable Business Model Archetypes [3], and the Circular Business Model Canvas [84] provided valuable insights for business model design and assessment, but they predominantly assumed institutional structures, resource availability, and formalized economic systems that are characteristic of developed economies. Our integrated framework centered on the realities of emerging economies by integrating informal sector dynamics, institutional voids, resource constraints, and social value creation. A critical comparison across five analytical dimensions showed that these differences were concrete. First, regarding the assumed economic context, the ReSOLVE Framework and Sustainable Business Model Archetypes implicitly assumed formalized markets with functioning regulatory enforcement and capital availability, while the Circular Business Model Canvas was designed for established corporate contexts. Our framework is the first to explicitly build institutional voids and informal economic activities into its structural logic rather than treating them as peripheral constraints to be overcome. Second, regarding informal sector treatment, none of these three frameworks assigned a substantive role to informal actors, with waste pickers and community-based recovery networks appearing as marginal supply-side inputs. Our framework reconceptualized these actors as definitive stakeholders [68] whose resource control and network capabilities were foundational to circular value creation in emerging economies. Third, regarding institutional void consideration, the previous frameworks assumed that regulatory pressure, property rights, and contract enforcement were available levers for implementation. Our framework's Contextual Embeddedness dimension and Institutional Development Pathway explicitly addressed how firms construct alternative governance structures in the absence of these mechanisms, extending institutional void theory to circular business model design [8]. Fourth, regarding social value weighting, in the ReSOLVE and Archetypes frameworks, social outcomes appeared as co-benefits of environmental and economic strategies. Our framework elevated social value creation to a co-equal strategic dimension, consistent with the empirical finding in Section 3.5.4 that social impact motivated CEBMI adoption more strongly than environmental considerations in emerging economy contexts [46, 48]. Fifth, regarding framework orientation, the existing frameworks were primarily prescriptive typologies presenting fixed archetypes or strategic options. Our framework was explicitly evolutionary and dynamic, capturing the staged development of CEBMI capabilities over time and the feedback loops between contextual factors, implementation pathways, and outcomes—a dimension absent from the three previous frameworks.

This critical comparison also distinguished our contribution from recent systematic literature reviews addressing related topics. Alsaoudi et al. [23], Ferrer-Serrano and Salesa [24] conducted broad SLRs on the CE and sustainable performance, but neither restricted their corpus to emerging economies or applied bibliometric science mapping to identify intellectual clusters. Ayaz and Tatoglu [25] examined social values in the CE specifically for emerging market SMEs, providing valuable quantitative evidence, but their study focused on a single dimension (social value) in one country (Turkey) using survey methods rather than mapping the full landscape of CEBMI research. Jibril et al. [26] addressed digital transformation in emerging markets post-pandemic but did not engage with circular economy frameworks. By contrast, this study (i) applied both bibliometric and qualitative content analysis to a CEBMI-specific corpus restricted to emerging economies, (ii) identified the six-cluster intellectual structure of this emerging field, and (iii) synthesized these findings into an integrated framework that explicitly addressed four distinctive implementation characteristics identified through cross-study comparison. These distinctions confirm the originality of our contribution and clarify precisely where and how this review advances the existing knowledge.

3.7 Implementation strategies and case application

3.7.1 Sector-specific implementation strategies

Our analysis revealed that CEBMI implementation strategies must be tailored to sector-specific dynamics in emerging economies. Manufacturing sectors benefit from industrial symbiosis, connecting formal producers with informal recovery networks as hybrid production systems that balance automation with labor-intensive processes and quality verification systems that operate despite institutional voids. Agricultural implementations should prioritize optimizing the biological cycle through composting, fostering direct relationships between processors and smallholders, and implementing community-based collection systems. The construction sector's approaches emphasize material recovery over new building, alternative certification systems for recovered materials, and decentralized waste processing.

3.7.2 Case application: Coffee sector circularity in Tanzania

The application of our framework can be illustrated through Lagrasta et al.'s [85] case study of circular business models in Tanzania's coffee sector. Traditional linear approaches in coffee production resulted in 60% of the coffee cherry biomass being discarded as waste, contributing to water pollution and soil degradation. The initiative demonstrated each dimension of our framework as follows:

Contextual Embeddedness: The initiative explicitly acknowledged the crucial role of informal collectors in aggregating coffee processing wastes across geographically dispersed small farms, formalizing relationships with these collectors while preserving their autonomy and local knowledge.

Multi-stakeholder Value Creation: The model generated economic value through new revenue streams from waste valorization (resulting in a 25% income increase for farmers), environmental value through reduced water pollution and the production of organic compost, and social value through the creation of new employment opportunities and community empowerment.

Adaptive Implementation: The initiative combined all three pathways in our framework by formalizing relationships with informal collectors (informal integration pathway), creating a multi-stakeholder governance platform for quality standards and pricing (institutional development pathway), and developing low-cost, locally appropriate composting techniques instead of importing expensive machinery (frugal innovation pathway).

Evolutionary Development: Over three years, the initiative evolved from basic resource efficiency (waste reduction in processing) to value chain reconfiguration (creating closed loops for organic matter) and business model innovation (developing new revenue streams from previously discarded materials), with each stage building on the learning from the previous phases.

3.8 Implications

3.8.1 Theoretical implications

This research makes two significant theoretical contributions. The first concerns institutional entrepreneurship in circular systems operating under severe governance and capital constraints. Our findings extend institutional void theory and resource orchestration theory, demonstrating that organizations do not need to wait for regulatory or market infrastructure to mature before innovating circular business models. Traditional institutional theory casts firms as passive responders to external pressures, while resource orchestration theory typically assumes that companies have resources to deploy. Both assumptions break down in emerging economy contexts. Our research shows that capital and input scarcity can catalyze institutional entrepreneurship, with firms simultaneously constructing governance substitutes while developing frugal circular solutions [86, 87].

Second, regarding stakeholder network reconfiguration in informal-formal integration, our analysis reconceptualizes the role and salience of informal actors in circular business models. Traditional stakeholder theory, particularly the power-legitimacy-urgency framework [68], classifies informal economic actors as "latent" or "discretionary" stakeholders due to their limited formal power and legitimacy. Our analysis reveals that in emerging economies, these actors control critical resources and capabilities, positioning them as "definitive" stakeholders central to value creation.

3.8.2 Practical implications

Our research provides specific guidance for three key stakeholder groups implementing CEBMI in emerging economies.

Business leaders should prioritize establishing formal partnerships with informal sector organizations as essential elements of circular value networks, invest in adaptive technological solutions that complement rather than replace labor-intensive processes, and develop measurement systems that explicitly track social value creation alongside environmental and economic outcomes.

Policymakers should develop simplified registration pathways for informal actors rather than attempting to eliminate informal activities, implement graduated standards that acknowledge resource constraints while encouraging continuous improvement, and support collaborative governance mechanisms that engage multiple stakeholders in standard-setting and enforcement.

Development organizations and investors should prioritize support for hybrid models integrating formal and informal

economic activities, develop financing mechanisms that accommodate the evolutionary nature of CEBMI implementation, and invest in local capacity building for specific capabilities, particularly institutional development and frugal innovation skills.

3.9 Limitations and future research directions

Despite its contributions, this study has several limitations that suggest promising avenues for future research. Our bibliometric approach, while systematic, primarily captured formal academic discourse, potentially missing practical implementation knowledge embedded in non-academic sources. Future research should complement this with an analysis of gray literature, field studies of informal practices, and participatory action research that engaged both formal and informal stakeholders.

Although theoretically grounded, our framework required empirical validation through comparative case studies spanning multiple regions, longitudinal implementation tracking, and quantitative testing of relationships between framework dimensions. Digital transformation is a crucial enabler and requires a deeper examination of technologies suitable for resource-constrained environments, adaptation strategies for emerging economies, and mechanisms that integrate with existing informal practices.

A cross-regional comparative analysis would enhance our understanding of how implementation varies across Africa, Asia, and Latin America by examining how different governance structures and cultural factors shape adoption pathways. Recent region-specific reviews provide promising starting points. Lwesya et al. [14] mapped six CE practice clusters across Africa, Gallego-Schmid et al. [16], van Hoof and Aguilar-Hernández [17] documented CE policy architectures across Latin America and the Caribbean, and Rovanto and Virtanen [20] compared CE slowing-loop capabilities across China, Finland, and Japan. Future research should build on these region-specific foundations to develop comparative frameworks that explain why CE business model configurations differ across regional institutional contexts, and determine the contextual conditions necessary for the adaptive pathways identified in our framework to be effective. Ultimately, translating our findings into effective policy frameworks remains a critical research direction, focusing on simplified regulatory pathways, collaborative governance models that bridge formal and informal divides, and appropriate frameworks for measuring social impacts in the multi-dimensional value environments that characterize emerging-economy CEBMI [16, 21].

4. CONCLUSIONS

This systematic literature review examined CEBMI in emerging economies across 58 Scopus-indexed publications between 2010 and 2024. Guided by four research questions, the study combined bibliometric analysis with qualitative content analysis to map the field's evolution, intellectual structure, implementation characteristics, and theoretical foundations. The findings are presented below in direct correspondence with each research question, closing the analytical loop opened at the outset of the study.

Regarding RQ1 — how CEBMI research in emerging economies evolved between 2010 and 2024 — the analysis revealed three distinct phases. The Experimental Phase (2010–2017) produced isolated foundational studies, with Park et al. [32] establishing the first integrative framework for circular business value in China. The Growth Phase (2018–2021) saw rapid expansion, with publications rising from 1 in 2017 to 8 in 2021 and citation counts peaking at 572 in 2020, driven by heightened sustainability awareness and COVID-19-related supply chain disruptions. The Maturation Phase (2022–2024) consolidated this growth into specialized research streams, with 18 publications in 2023 and increasing methodological sophistication. Brazil, India, and China accounted for the majority of documented cases, while key influencing journals spanned industrial ecology, environmental management, and strategic management, reflecting the field's inherently cross-disciplinary character. Regarding RQ2 — what intellectual structures and thematic clusters characterize this literature — bibliographic coupling analysis identified six distinct research clusters as (1) Implementation Barriers and Enablers, (2) Manufacturing Contexts and Resource Efficiency, (3) Business Model Innovation and Value Creation, (4) Digital Transformation and Technological Enablers, (5) Economic Resilience and Adaptive Strategies, and (6) Sustainability Integration and Social Impact. Keyword co-occurrence analysis confirmed the centrality of "circular economy" as the integrating concept, while revealing a lack of shared mid-level constructs and a gap between empirical social-value findings and theoretical codification. Cluster link strength patterns indicated that Clusters 4 and 5 functioned as emerging theoretical bridges, reshaping the field's conceptual architecture despite modest citation counts. Regarding RQ3 — what distinctive characteristics differentiate CEBMI in emerging economies from developed-country contexts — the content analysis identified four structural differences. First, the informal sector was not a peripheral actor but an essential value-chain partner, requiring formal integration rather than elimination. Second, governance gaps required firms to construct alternative institutional arrangements — through multi-stakeholder networks, industry associations, and co-designed standards — rather than relying on regulatory pressure. Third, resource limitations drove frugal and bricolage-based business model configurations that constituted genuine competitive advantages rather than compensatory workarounds. Fourth, social value creation functioned as a primary adoption motivator in emerging economies, inverting the environmental-first priority logic of most developed-economy CE frameworks. Regarding RQ4 — what integrated conceptual framework can guide CEBMI implementation in emerging economies — the study proposed a four-dimension framework grounded in a hierarchical causal chain of theories as Contextual Embeddedness (institutional void theory), Multi-stakeholder Value Creation (stakeholder theory), Adaptive Implementation Pathways (resource orchestration theory), and Evolutionary Development (evolutionary capabilities theory). The framework was distinguished from existing models by its explicit incorporation of informal sector dynamics, governance gaps, and social value as structural design dimensions rather than contextual footnotes, and by its dynamic feedback architecture that captured how each dimension shaped and was reshaped by the others over time.

This research makes three primary contributions. First, it provides the first comprehensive bibliometric analysis specifically focused on CEBMI in emerging economies. Second, it extends institutional void theory and stakeholder

theory by reconceptualizing informal actors as definitive stakeholders central to circular value creation. Third, it offers an integrated framework that provides context-specific guidance for implementing circular business models in environments characterized by substantial informal sectors, institutional voids, and resource constraints.

By addressing how circular business models can be successfully implemented in these distinctive contexts, this research contributes to more inclusive and contextually appropriate approaches to sustainable economic development in emerging economies.

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