

Sustainable Business Models: Bridging Theory and Practice Through an Integrative Conceptual Review

Timur Kogabayev ^{1,2,*} , Bakytzhan Akan ³, Assel Akan ³, Meruyert Bekturganova ³ and Rando Värnik ²

¹ International School of Economics, Maqsut Narikbayev University (KAZGUU), Astana 020000, Kazakhstan

² Institute of Agricultural and Environmental Sciences, Estonian University of Life Sciences, 51006 Tartu, Estonia; rando.varnik@emu.ee

³ MNU Business School, Maqsut Narikbayev University (KAZGUU), Astana 020000, Kazakhstan; b_akan@kazguu.kz (B.A.); a_akan@kazguu.kz (A.A.); m_bekturganova@kazguu.kz (M.B.)

* Correspondence: kogabayev@kazguu.kz

Abstract

Sustainable business models (SBMs) describe how organizations create, deliver, and capture value while simultaneously generating economic, environmental, and social benefits for a broad set of stakeholders. Although the field has expanded rapidly since the late 2000s, the literature remains conceptually dispersed: definitions proliferate, design tools and archetypes coexist without integration, and findings on the link between sustainability practices and firm performance remain inconsistent. To address this fragmentation, this study conducts a PRISMA 2020-guided systematic literature review of foundational and recent contributions published between 2008 and 2025. Of 300 records identified through database searching, 30 studies met the eligibility criteria and were synthesized qualitatively; these are interpreted together with complementary theoretical and methodological literature. Rather than reporting bibliometric indicators, the review synthesizes the field across three dimensions: the evolution of the SBM concept, its dominant design logics and archetypes, and its contemporary thematic landscape. The findings trace a progression from foundational triple-bottom-line conceptualization, through archetype- and tool-based design approaches such as the Triple-Layered Business Model Canvas and pattern taxonomies, toward digitally enabled, circular, and resilience-oriented models. These patterns are interpreted through complementary theoretical lenses—the resource-based and natural-resource-based views, dynamic capabilities, information-processing theory, and stakeholder theory. The review consolidates these insights into an integrative conceptual framework that links theoretical foundations, value-design dimensions, enabling capabilities, and triple-bottom-line outcomes. It further discusses implications for managers and outlines a research agenda emphasizing digital and circular enablers, longitudinal designs, and the under-examined context of emerging markets, with an applied emphasis on Central Asia and Kazakhstan.



Academic Editors: Mordechai Chaziza and Carmela Lutmar

Received: 4 July 2026

Revised: 24 July 2026

Accepted: 5 August 2026

Published: 7 August 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

Keywords: sustainable business models; business model innovation; circular economy; triple bottom line; triple-layered business model canvas; sustainability; conceptual review; emerging markets; Central Asia; Kazakhstan

1. Introduction

The business model concept has become a central lens in management research for explaining how firms organize value creation, delivery, and capture [1–3]. Scholars have used it to analyze value creation in digital and networked contexts [4], to frame the

opportunities and barriers of business model innovation [5], and to trace the concept's origins and development [6]. Building on the recognition that business models matter for competitive outcomes [7], the concept has been progressively extended to encompass sustainability. A sustainable business model (SBM) reframes the conventional logic of value creation so that economic returns are pursued together with—rather than at the expense of—environmental integrity and social welfare across a broad network of stakeholders [8–10]. This reframing responds to mounting pressure on firms to decouple growth from resource depletion and social harm and to translate sustainability commitments into the architecture of how they actually do business [11,12]. As a result, SBMs are increasingly viewed as an important lever for embedding sustainability into corporate strategy and as a plausible source of competitive advantage [13,14].

Despite this momentum, SBM research remains conceptually fragmented. Definitions proliferate across overlapping traditions—sustainability-oriented, circular, social-enterprise, and product-service perspectives—often without a shared vocabulary or boundary conditions [13,15,16]. Design contributions have multiplied in parallel: archetype taxonomies [10], canvas-based design tools such as the Triple-Layered Business Model Canvas (TLBMC) [14], pattern libraries [17], and structured innovation processes [13] coexist but are rarely integrated into a coherent account of how SBMs are conceived, enabled, and governed. Empirical evidence on the relationship between sustainability practices and performance is similarly mixed, and much of the literature remains descriptive rather than explanatory [16,18]. Recent contributions in Sustainability illustrate both the field's vitality and its dispersion, mapping sustainable and circular business model innovation [16], design-thinking approaches [19], and organizational-design perspectives [20] without yet converging on an integrative synthesis.

Several reviews have advanced the field by clarifying concepts [13], questioning whether SBM research is an emerging field or a passing fancy [15], typologizing circular business model patterns [21], reviewing circular business models and their innovation [22,23], and assessing design tools [24]. At a higher level of aggregation, an umbrella review of 57 systematic literature reviews has organized the antecedents and outcomes of sustainable business model innovation into an integrative framework [25], while bibliometric analyses have mapped the field's intellectual structure and its accelerating publication dynamics [26]. These contributions are valuable, yet they tend to examine the SBM concept, its design archetypes, or its emerging technological frontier in isolation. Less attention has been paid to connecting the consolidated conceptual core of SBM research with its rapidly evolving thematic frontier—digitalization, circularity, and resilience—and to interpreting both through an explicit theoretical scaffold. This leaves a gap for an integrative perspective that links the structural development of the field, its dominant design logics, and the theoretical mechanisms through which SBMs are expected to generate sustainable value. The need for such integration is especially acute for emerging and resource-dependent economies, including those of Central Asia, where sustainability transitions are accelerating but remain weakly theorized [27]. The Central Asian emphasis in this review reflects both this documented gap in the literature and the authors' institutional grounding in the region; it is developed in Section 4.3 as a deliberate applied extension of the conceptual framework, rather than as an ancillary case study.

This study addresses that gap through a structured, PRISMA-informed conceptual review of the SBM literature published between 2008 and 2025. The approach is deliberately interpretive rather than metric-driven: it does not compute citation counts or apply automated topic models, but instead synthesizes foundational and recent contributions qualitatively to clarify the field's evolution, design logics, and thematic structure. The review follows a gap-method-insight logic. The gap concerns the limited integration of the

mature conceptual core of SBM research with its emerging digital and circular frontier. The method combines a transparent review protocol with theory-informed thematic synthesis. The insight lies in explaining how foundational concepts, design archetypes, enabling capabilities, and triple-bottom-line outcomes are connected. The research objectives are stated accordingly. PRISMA 2020 is applied specifically to the identification and screening stages, where its structured reporting supports transparency and reproducibility; the narrative synthesis itself follows established guidance for integrative and thematic literature reviews [28,29] rather than treating PRISMA as a meta-analytic checklist to be satisfied in full. Relative to prior SBM reviews, which have examined the concept, its design archetypes, or its digital and circular frontier largely in isolation [13,15,21–26], the distinctive contribution of this review is to connect these strands explicitly through a shared theoretical scaffold, yielding an integrative framework rather than an additional domain-specific synthesis.

RO-1. To trace the conceptual evolution of SBM research between 2008 and 2025 and to characterize its principal phases of development.

RO-2. To synthesize the dominant design logics, archetypes, and recurring themes of SBM research, distinguishing well-established areas from emerging directions.

RO-3. To integrate these insights into a theory-informed conceptual framework that links foundations, design dimensions, enablers, and outcomes, and to derive implications for practice and future research.

The remainder of the paper is organized as follows. Section 2 defines the SBM concept, describes the review approach, and introduces the theoretical lenses. Section 3 presents the findings: the evolution of SBM research, its archetypes and design logics, its thematic landscape, and an integrative conceptual framework. Section 4 discusses theoretical and managerial implications, considers SBMs in emerging-market contexts, and outlines limitations and future research. Section 5 concludes.

2. Conceptual Background and Review Approach

2.1. Defining Sustainable Business Models

The business model is commonly understood as a simplified representation of how an organization creates, delivers, and captures value [1,3]. Foundational work framed the business model as an activity system [4], emphasized its strategic and value-capturing role [2,7], and charted its conceptual development and persistent definitional ambiguity [5,6]. Sustainability scholars extended this logic by arguing that value should be conceived in plural terms, spanning the economic, environmental, and social dimensions of the triple bottom line (TBL) [30]. Early conceptual work characterized the sustainability business model as one that internalizes social and environmental considerations into its core value proposition and stakeholder relationships rather than treating them as peripheral add-ons [8,9]. Building on this foundation, SBMs are now generally defined as models that create value for, and in collaboration with, a broad range of stakeholders while reducing negative and increasing positive externalities for society and the natural environment [10,13]. Complementary perspectives broaden the notion of value still further, for example by drawing attention to value that remains uncaptured—surplus, absent, missed, or destroyed—as a trigger for sustainable business model innovation [31], and by clarifying the activities, design themes, and value functions that make a business model sustainable [32]. The field has also examined the converse case of unsustainable business models that institutionalize social and environmental harm [33], and has debated whether SBM scholarship constitutes an emerging field or a passing fancy [15].

Two adjacent streams have shaped the contemporary understanding of SBMs. The first is sustainable business model innovation (SBMI), which concerns the processes through which firms reconfigure value-creation logics toward sustainability [13,18], supported by

design-thinking and value-mapping methods that operationalize the modeling process in practice [34]. The second is the circular economy, which reframes value creation around closed material and energy loops, reuse, remanufacturing, and resource recovery [35]. Circular business models are increasingly treated as a sustainability-oriented subclass of SBMs, and the boundary between sustainable and circular models has become a productive area of synthesis [22,36,37]. Throughout this review, SBMs are treated as the encompassing category, with circular models understood as one prominent and rapidly maturing manifestation.

2.2. Review Approach and Protocol

2.2.1. Methodological Positioning

This study adopts an integrative literature review design [38,39]. Integrative reviews are considered the appropriate review form when a field has accumulated a substantial but fragmented body of knowledge and when the intended contribution lies in critique, re-conceptualization, and framework building rather than in the statistical aggregation of effect sizes [38,40]. Accordingly, the review combines the procedural transparency of systematic approaches with the conceptual ambition of integrative synthesis: the identification and screening stages follow an explicit, reproducible protocol informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework [41] and by established guidance on evidence-informed management reviews [42,43], while the analysis stage is concept-centric rather than study-centric, organizing the literature around ideas, design logics, and theoretical mechanisms instead of individual articles [42]. This hybrid positioning is consistent with contemporary typologies of review research, which distinguish domain-based, theory-based, and framework-development reviews as complementary contribution types [28,40].

This review combines two complementary layers. Its identification and screening stages follow the PRISMA 2020 statement [41]: a systematic database search was conducted, records were screened against explicit eligibility criteria, and the resulting corpus of included studies is reported in full, with counts at every stage, in Table 1, Figure 1, and the completed checklist in Appendix A. Its analysis stage is qualitative rather than statistical: because the included studies vary widely in constructs, measures, and methods, findings are synthesized narratively through the thematic procedure described in Section 2.2.3 rather than pooled in a meta-analysis. This combination is well suited to a field whose principal challenge is conceptual integration rather than the absence of primary studies—a challenge documented by the umbrella review of 57 systematic reviews in this domain [25]—and it complements rather than replaces the bibliometric and machine-learning approaches increasingly applied to the field and to adjacent domains [26,44]. The review protocol was registered with OSF Registries (<https://osf.io/8m26v/>, accessed on 1 August 2026) prior to full-text screening; PROSPERO was not used because it does not accept protocols for reviews outside health-related fields. No amendments were made to the protocol after registration. Screening and full-text eligibility assessment were conducted by a single author (T.K.), without a second independent screener or a calculated inter-coder agreement statistic (Section 4.4). A validated risk-of-bias instrument (e.g., the Mixed Methods Appraisal Tool or the Critical Appraisal Skills Programme (CASP) checklists [45]) was not adapted for this corpus because the 30 included studies span conceptual, qualitative, and quantitative contributions of differing formal structure, for which a single standardized instrument does not straightforwardly apply; adapting such an instrument for a more homogeneous future corpus is noted as a direction for future research in Section 4.4.

Table 1. Overview of the review approach and protocol (Source: Authors).

Protocol Element	Description
Review type	PRISMA 2020-guided systematic identification and screening [41], combined with qualitative narrative/thematic synthesis (not meta-analysis).
Databases	Scopus and Web of Science.
Time frame	2008–2025.
Search fields	Scopus TITLE-ABS-KEY and Web of Science TS (topic).
Core search terms	(“sustainable business model” OR “business model for sustainability” OR “sustainable business model innovation” OR “circular business model”). Full per-database strings (Appendix B, Table A2): Scopus—TITLE-ABS-KEY(“sustainable business model*” OR “business model* for sustainab*” OR “sustainable business model innovation” OR “circular business model*”) AND PUBYEAR > 2007 AND PUBYEAR < 2026 AND DOCTYPE(ar) AND LANGUAGE(English); Web of Science—TS = (“sustainable business model*” OR “business model* for sustainab*” OR “sustainable business model innovation” OR “circular business model*”), refined to Article, English, 2008–2025. The complete strings, including all truncation and field-code variants used, are provided in Appendix B (Table A2).
Inclusion	Published 2008–2025; peer-reviewed journal articles; written in English; empirical research (quantitative, qualitative, or mixed methods); directly addressed the review’s topic and objectives; full text available.
Exclusion	Duplicate publications; conference abstracts, editorials, book reviews, dissertations, or theses; studies outside the review’s scope; articles without empirical data; non-English publications; full text unavailable; insufficient methodological quality.
Records	300 records identified through database searching; 45 duplicates removed; 255 records screened; 185 excluded at title/abstract screening; 70 full-text articles assessed for eligibility; 40 excluded at full-text stage (see Figure 1 for reasons); 30 studies included in qualitative synthesis.
Screening	Two-stage manual screening: (i) title–abstract relevance; (ii) full-text assessment against inclusion criteria. No automated decision tools. Conducted by a single author (T.K.); no second independent screener or inter-coder agreement statistic (Section 4.4).
Quality appraisal	Methodological quality was assessed narratively during full-text screening; articles lacking sufficient methodological clarity or reliability were excluded ($n = 7$). No formal validated risk-of-bias instrument was applied, consistent with a qualitative (non-meta-analytic) synthesis design. MMAT and CASP [45] were considered but not adapted, because the corpus mixes conceptual, qualitative, and quantitative contributions for which a single standardized instrument does not straightforwardly apply (see Section 2.2.1).
Complementary search	Backward and forward citation snowballing from foundational works [42].
Synthesis	Three-stage thematic synthesis [29]: (i) familiarization and open coding; (ii) concept-matrix categorization across evolution, archetypes/design logics, and contemporary themes [42]; (iii) theoretical abstraction into a conceptual framework [46].
Trustworthiness	Credibility, dependability, confirmability, and transferability criteria [47]; protocol-based audit trail. Applied at the level appropriate to single-reviewer, non-meta-analytic synthesis; does not substitute for multi-reviewer inter-rater evidence (Section 4.4).
Registration	Registered with OSF Registries (https://osf.io/8m26v/ , accessed on 1 August 2026) prior to full-text screening. PROSPERO was not used because it does not accept protocols for reviews outside health-related fields. No amendments were made to the protocol after registration.
Tools	Zotero for reference management; NVivo for qualitative coding; conceptual diagrams constructed by the authors.

Note: In the search strings, the asterisk (*) denotes right-hand truncation, retrieving morphological variants (e.g., “model”/“models”, “sustainable”/“sustainability”).

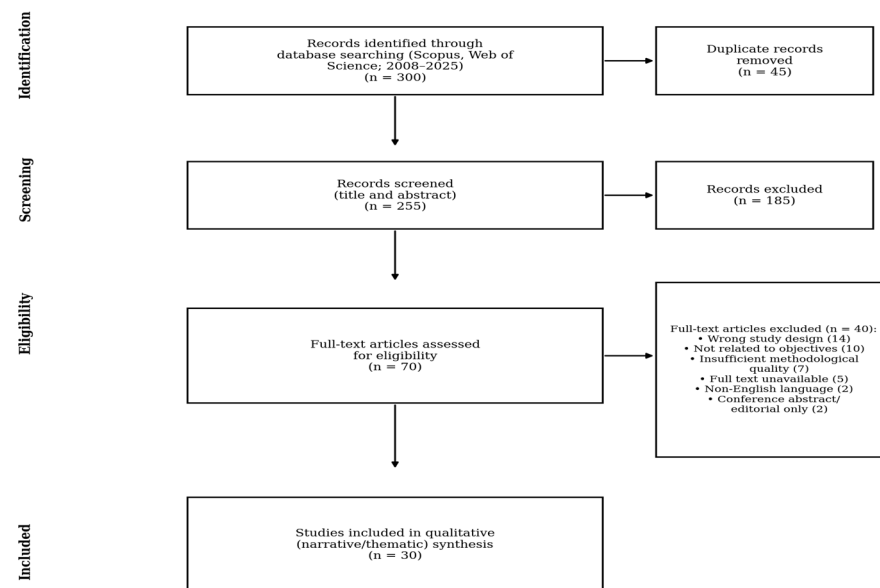


Figure 1. PRISMA 2020 flow diagram of record identification, screening, eligibility assessment, and inclusion (adapted from Page et al. [41]) (Source: Authors).

2.2.2. Search Strategy and Corpus Construction

The literature was identified through Scopus and Web of Science using title–abstract–keyword queries combining business-model terminology with sustainability and circularity terms (for example, “sustainable business model”, “business model for sustainability”, “sustainable business model innovation”, and “circular business model”), limited to peer-reviewed, English-language journal articles published between 2008—the year of the first explicit conceptualizations of the sustainable business model [8]—and 2025. The search returned 300 records; after removing 45 duplicates, 255 unique records were screened by title and abstract, of which 185 were excluded for lacking clear conceptual relevance to SBMs (e.g., corporate-sustainability or CSR studies without a business-model focus). The remaining 70 full-text articles were assessed against the eligibility criteria in Table 1; 40 were excluded for wrong study design (14), lack of relevance to the review’s objectives (10), insufficient methodological quality (7), unavailable full text (5), non-English language (2), or conference-abstract/editorial format (2). The remaining 30 studies were retained and synthesized qualitatively; the full flow is reported in Figure 1. Database searching was complemented by backward and forward citation snowballing from the foundational works identified in Section 2.1, a strategy recommended for concept-centric reviews to reduce the risk of database- and keyword-driven omissions [13,42]. Beyond these 30 systematically identified empirical studies, the manuscript additionally cites established theoretical, methodological, and review-methods sources (e.g., the theoretical lenses in Section 2.3 and the review-design literature in Section 2.2.1) to develop and interpret the conceptual framework; these sources were identified through targeted, non-systematic searching rather than the database protocol above and are distinguished from the 30 included studies throughout the Findings in Section 3. The review protocol is detailed in Table 1. No formal saturation criterion was applied at any stage; completeness at the full-text stage instead reflects exhaustive assessment of all 70 retrieved articles against the eligibility criteria in Table 1, rather than saturation-based sampling. Because the inclusion criteria required empirical data, potentially influential conceptual or theoretical contributions were necessarily excluded from the 30-study systematic corpus at this stage; such works are, where relevant, incorporated separately as non-systematic theoretical sources, as noted above, and their possible omission from the systematic corpus is acknowledged as a limitation in Section 4.4.

2.2.3. Analysis and Synthesis Procedure

The retained corpus was analyzed through a three-stage thematic synthesis adapted from established thematic analysis procedures [29]. In the first stage (familiarization and open coding), each contribution was read in full and coded for its definitions, value logics, design tools, mechanisms, contexts, and theoretical anchoring. In the second stage (categorization), codes were consolidated in a concept matrix [42] and organized along the three analytic dimensions that structure Section 3: the temporal evolution of the field, its archetypes and design logics, and its contemporary thematic landscape. In the third stage (theoretical abstraction), descriptive categories were progressively abstracted into higher-order theoretical themes, following the general logic of moving from first-order concepts to second-order themes and aggregate dimensions [46]; the aggregate dimensions correspond to the layers of the integrative framework presented in Section 3.4. Throughout the second and third stages, each emerging theme was interrogated through the theoretical lenses introduced in Section 2.3, so that the resulting framework is explanatory rather than merely descriptive. Coding was carried out in NVivo, and coding and categorization decisions were documented in the review protocol to preserve an audit trail from search terms to framework elements.

2.2.4. Rigor and Trustworthiness

Because the synthesis is qualitative and interpretive, rigor is assessed against the trustworthiness criteria of credibility, dependability, confirmability, and transferability [47]. These criteria are applied at the level appropriate to a single-reviewer, non-meta-analytic synthesis: they support methodological transparency and traceability, but—as noted in Section 4.4—they do not substitute for the inter-rater reliability evidence associated with multi-reviewer systematic reviews. Credibility is supported by triangulation across two databases (Scopus and Web of Science) and across review genres—conceptual, systematic, bibliometric, and umbrella reviews [13,25,26]—so that the identified patterns do not depend on a single evidence stream. Dependability is supported by the documented protocol in Table 1, which provides an audit trail covering search strings, screening criteria, and synthesis stages. Confirmability is supported by anchoring every interpretive claim in cited, verifiable published sources and in established theory rather than in unreported data. Transferability is addressed through explicit attention to boundary conditions, in particular the emerging-market and Central Asian contexts examined in Section 4.3. The remaining limitations of the design—including the absence of formal inter-coder reliability statistics and of quantitative corpus indicators—are acknowledged in Section 4.4.

2.3. Theoretical Lenses

To move beyond description, the thematic patterns identified in this review are interpreted through a set of complementary management theories. These lenses are not treated as competing explanations but as partial accounts that together clarify how SBMs are expected to generate sustainable value. The resource-based view (RBV) frames sustainability-related capabilities as strategic resources [48]; the natural-resource-based view (NRBV) links competitive advantage explicitly to environmental capabilities such as pollution prevention, product stewardship, and sustainable development [49]; dynamic capabilities theory (DCT) explains how firms sense, seize, and reconfigure resources under change [50], a logic recently connected directly to business models [51] and to the organizational-design conditions for sustainable business model innovation [52]—including leadership commitment, organizational culture, employee engagement, innovation capability, and digital maturity as the conditions through which sensing and seizing capabilities are translated into operational reconfiguration; information-processing theory (IPT) and its organizational extension

(OIPT) account for the role of digital technologies in reducing information asymmetry across multi-tier value networks [53]; stakeholder theory situates value creation within a network of legitimate claims [54]; and the triple bottom line (TBL) provides the normative rationale that underpins the field [30]. Table 2 summarizes these lenses and their relevance to SBM research. A complementary organizational-architecture perspective is offered by the Business Excellence literature, most notably the EFQM 2020 Model, which integrates purpose, strategy, stakeholder engagement, sustainable value creation, and organizational transformation within a single management architecture aligned with the UN Sustainable Development Goals [55]. This literature falls outside the systematically reviewed corpus but represents a promising direction for future research connecting SBM design with the organizational conditions that translate sustainability intentions into operational practice.

Table 2. Glossary of theoretical lenses applied in the synthesis (Source: Authors).

Theoretical Lens	Relevance to Sustainable Business Models
Resource-Based View (RBV) [48]	Treats sustainability-related capabilities—green innovation, supplier collaboration, environmental management—as valuable, rare, and hard-to-imitate resources that underpin competitive advantage.
Natural-Resource-Based View (NRBV) [49]	Extends RBV by tying advantage to environmental capabilities: pollution prevention, product stewardship, and sustainable development; interprets circular and green value creation.
Dynamic Capabilities Theory (DCT) [50,51]	Explains how firms sense sustainability pressures, seize opportunities, and reconfigure resources to adapt business models under regulatory, market, and technological change.
Information-Processing Theory (IPT/OIPT) [53]	Accounts for the role of digital technologies—analytics, blockchain, AI, IoT—in improving visibility, traceability, and coordination across multi-tier value networks.
Stakeholder Theory [54]	Frames value creation as the management of legitimate claims across customers, suppliers, communities, employees, and the natural environment.
Triple Bottom Line (TBL) [30]	Provides the normative foundation of the field by conceptualizing performance across interlinked economic, environmental, and social dimensions.
Organizational/Business Excellence (EFQM 2020) [55]	Complementary organizational-architecture framework linking purpose, strategy, stakeholder engagement, sustainable value creation, and transformation; noted as a direction for future integration rather than part of the systematic corpus.

3. Findings

3.1. Evolution of Sustainable Business Model Research

The synthesis reveals a discernible pattern of development that can be read as three overlapping phases (Figure 2). The first phase, spanning roughly 2008–2014, was foundational and conceptual. Scholars defined the sustainability business model, articulated TBL-based value logics, and grounded the emerging field in the resource-based and natural-resource-based views [8–10,30,49]. The emphasis lay on establishing the legitimacy of sustainability within business-model thinking and on distinguishing genuine SBMs from incremental eco-efficiency or CSR practices, an agenda anticipated by early calls to treat sustainability as a driver of innovation [56]. The three-phase periodization was derived

inductively by reading the retained corpus as a whole and identifying where its dominant conceptual emphasis shifted; the anchor works cited within each phase illustrate that shift and are not themselves the basis on which the phase boundaries were drawn.

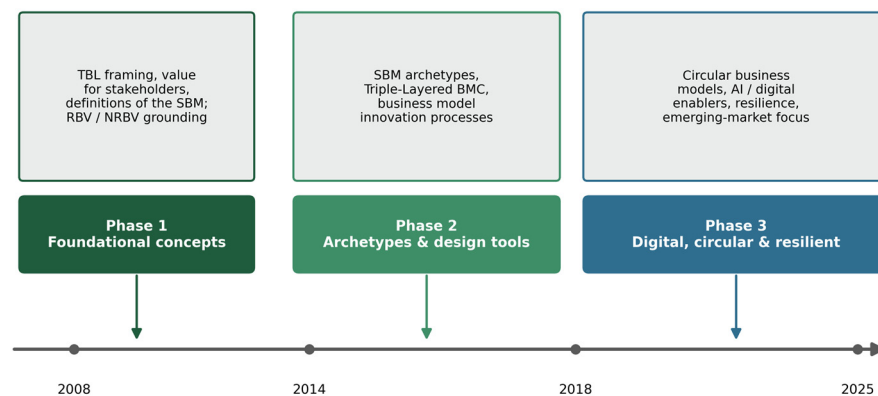


Figure 2. Three-phase evolution of sustainable business model research, from foundational conceptualization through archetype- and tool-based design to digitally enabled, circular, and resilience-oriented models (Source: Authors).

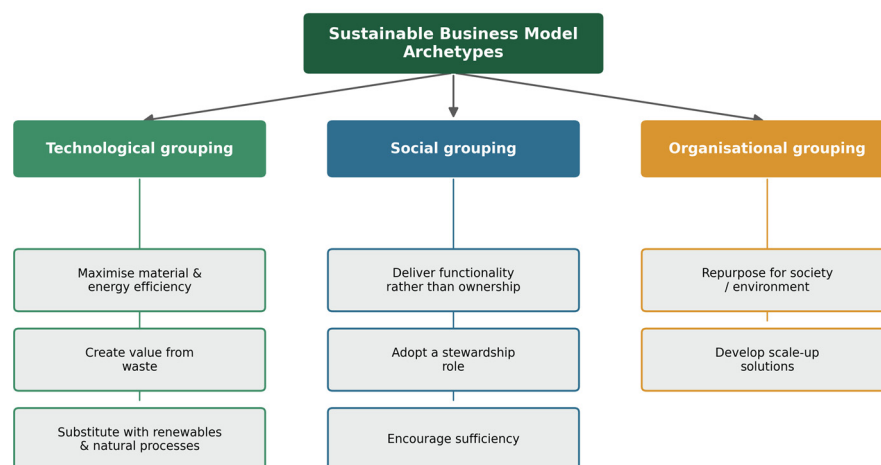
The second phase, approximately 2014–2018, marked a turn toward design and operationalization. Contributions in this period produced concrete tools and taxonomies: the eight SBM archetypes that organize mechanisms for value creation [10]; the Triple-Layered Business Model Canvas, which augments the conventional canvas with environmental and social layers [14]; the value-uncaptured perspective as a stimulus for innovation [31]; and expert-validated pattern taxonomies that consolidate dispersed design knowledge [17,57]. Structured accounts of sustainable business model innovation as a process also emerged in this period [13], translating the abstract value logics of the first phase into actionable design vocabularies.

The third phase, from roughly 2018 to 2025, is digitally enabled, circular, and resilience-oriented. Circular business models matured into a distinct and influential stream [22,35,37], while digital technologies—analytics, artificial intelligence, blockchain, and platform models—became central enablers of transparency and coordination, as reflected in recent bibliometric mappings of green and sustainable innovation [58,59]. Recent contributions in Sustainability reflect this frontier through work on circular and digital performance management [60], emerging-economy circularity [27], R&D-driven sustainable innovation in SMEs [61], and systematic and bibliometric reviews of sustainable innovation performance [62]. Across these phases, the field has moved from defining sustainability as a strategic orientation toward treating it as a capability-driven, information-intensive, and increasingly circular process.

3.2. Archetypes and Design Logics

A defining contribution of the field has been the codification of SBM archetypes—generic mechanisms through which firms can embed sustainability into value creation [10]. These archetypes are conventionally organized into technological, social, and organizational groupings, reflecting the predominant nature of the change each entails (Figure 3). Technological archetypes include maximizing material and energy efficiency, creating value from waste, and substituting with renewables and natural processes. Social archetypes include delivering functionality rather than ownership—the logic underpinning product–service systems [63]—adopting a stewardship role, and encouraging sufficiency. Organizational archetypes include repurposing the business for society and the environment and developing scale-up solutions. Although the archetypes are analytically distinct, firms typically

combine several, and the most ambitious SBMs integrate mechanisms across all three groupings [10,16].



Grouping after Bocken et al. (2014); archetypes span environmental, social and economic value creation.

Figure 3. Taxonomy of sustainable business model archetypes, grouped into technological, social, and organizational mechanisms of value creation (grouping after Bocken et al. [10]; figure constructed by the authors).

Design tools complement the archetypes by supporting the actual construction of SBMs. The Triple-Layered Business Model Canvas is the most widely adopted of these: it extends the original business model canvas [3] with an environmental layer informed by life-cycle thinking and a social layer informed by a stakeholder perspective, making the three types of value explicit and mutually visible [14]. Pattern-based approaches consolidate this knowledge into reusable design building blocks: the sustainable business model pattern taxonomy organizes forty-five patterns into expert-validated groups [17], and a parallel research agenda has examined their methodological status and use [57]. Process-oriented contributions situate these tools within iterative innovation cycles, emphasizing experimentation, prototyping, and stakeholder engagement [13,19], while attention to organizational design and dynamic capabilities clarifies the barriers and drivers that shape whether such innovation succeeds [52]. Within the circular stream, a dedicated body of tools and pattern libraries supports the design of closed-loop models [21,24,64]. Table 3 consolidates the archetypes with representative mechanisms and example applications.

These contributions differ markedly, however, in evidentiary maturity. The TLBMC and the archetype taxonomy are the most consistently applied and empirically illustrated design tools within the corpus, functioning as practical translation devices more than as tested causal models. Pattern libraries and process-oriented innovation frameworks remain largely conceptual, with adoption and effectiveness reported mainly through case description rather than systematic empirical testing. Where the corpus links design choices to outcomes at all, it does so through organizational-design and dynamic-capabilities explanations [52] rather than through direct tests of archetype performance; a systematic comparison of which archetypes and tools are empirically supported, which remain conceptual, and which lack any empirical grounding remains a needed direction for future research.

Table 3. Sustainable business model archetypes, mechanisms, and representative applications (synthesized after Bocken et al. [10] and circular-model literature [21,22,27]).

Archetype Grouping	Representative Mechanisms	Example Applications
Technological	Maximize material and energy efficiency; create value from waste; substitute with renewables and natural processes.	Lean and clean production; industrial symbiosis; renewable-energy and bio-based inputs.
Social	Deliver functionality rather than ownership; adopt a stewardship role; encourage sufficiency.	Product–service systems and servitization [63]; certification and ethical sourcing; demand-moderating models.
Organizational	Repurpose the business for society and the environment; develop scale-up solutions.	Hybrid and social enterprises; inclusive and base-of-pyramid models; collaborative scaling platforms.
Circular (cross-cutting)	Close, slow, and narrow resource loops through reuse, remanufacturing, recycling, and reverse logistics.	Take-back and refurbishment schemes; sharing platforms; closed-loop supply networks [22,27].

3.3. Thematic Landscape of Contemporary Research

Beyond the foundational concepts and archetypes, the recent literature is organized around several recurring themes (Figure 4). At the center lies the enduring concern with value creation, delivery, and capture, which connects every other theme. Surrounding it are five prominent clusters. Circular business models constitute the most developed emerging cluster, integrating resource-loop strategies into the SBM logic [22,37,60] and increasingly examined through dedicated reviews and case-based syntheses [23,65]. Digital and AI-enabled models form a fast-growing cluster in which data analytics, artificial intelligence, and blockchain function as enablers of transparency and decision support [58,59]. Empirical work in this cluster indicates that institutional pressures and data-analytics resources jointly shape the adoption of AI-enabled sustainable manufacturing and circular-economy capabilities [66], while recent PRISMA-based systematic reviews confirm the rapid but still fragmented growth of AI applications in the sustainable and circular economy [67]. Servitization and product–service systems represent a distinct design logic that shifts value from ownership to performance [14,63]. Governance and collaboration capture the inter-organizational and stakeholder mechanisms through which SBMs are coordinated and legitimized [12,68]. Finally, sector applications and emerging-market contexts reflect the field’s expansion into specific industries and economies, where regulatory and institutional conditions shape feasibility [27,61]. Keyword-based analyses of circular business model innovation confirm the growing prominence and dispersion of these themes [69].

These themes differ in maturity and in their degree of integration with the conceptual core. Circularity, servitization, and value creation are well consolidated and theoretically grounded; digital and AI-enabled models are highly active but still consolidating their theoretical contribution, which depends on explaining how technologies function as information-processing and coordination mechanisms rather than merely as tools [59]. Sector- and context-specific themes, including emerging-market applications, remain comparatively fragmented and only partially connected to the dominant agenda [20,27]. Table 4 summarizes the thematic dimensions, their representative focus, and their relationship to the conceptual core.

A related and still-emerging thread concerns how triple-bottom-line outcomes are actually measured. The corpus discusses TBL outcomes primarily in conceptual terms; it engages comparatively little with the KPI frameworks, ESG metrics, maturity-assessment models, and performance-measurement systems that operationalize those outcomes in practice. Given the growing prominence of ESG reporting requirements, this measurement

layer constitutes an emerging companion thread to the thematic landscape mapped above, and a priority for future thematic synthesis.

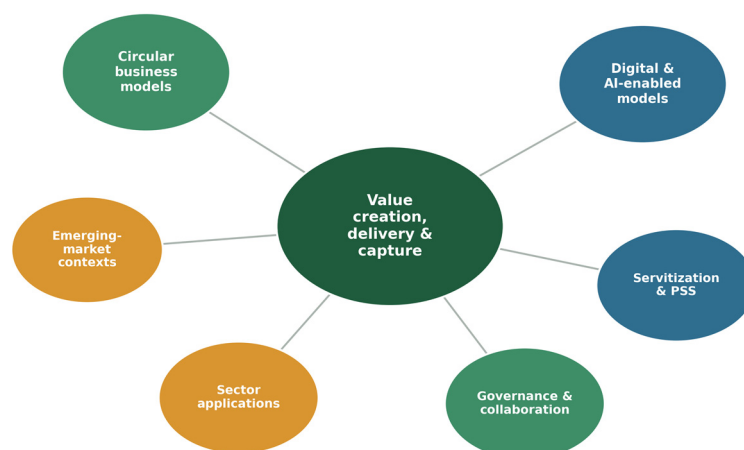


Figure 4. Thematic landscape of contemporary sustainable business model research, organized around a central value-creation core and adjacent clusters (Source: Authors).

Table 4. Thematic dimensions of contemporary sustainable business model research (Source: Authors).

Thematic Dimension	Representative Focus	Relation to Core
Value creation, delivery and capture	Sustainable value propositions; multi-stakeholder value; value-uncaptured logic [31,32].	Conceptual core.
Circular business models	Closed loops; reuse, remanufacturing, recycling; circular value recovery [22,37,60].	Consolidated extension.
Digital and AI-enabled models	Analytics, AI, blockchain, platforms as transparency and coordination enablers [58,59].	Active, consolidating.
Servitization and product–service systems	Functionality and outcome-based value; ownership shifts [14,63].	Consolidated extension.
Governance and collaboration	Partnerships, stakeholder engagement, and adaptive governance [12,68].	Consolidated extension.
Sector and emerging-market contexts	Industry-specific and emerging-economy applications and constraints [27,61].	Fragmented frontier.

3.4. An Integrative Conceptual Framework

Synthesizing the evolution, archetypes, and themes, Figure 5 presents an integrative conceptual framework for SBMs. The framework is organized into four interacting layers. At its base lie the theoretical foundations—RBV, NRBV, dynamic capabilities, information-processing theory, stakeholder theory, and the triple bottom line [30,48–51]—which provide the explanatory mechanisms for the layers above. The first substantive layer comprises the value foundations of an SBM: a sustainable value proposition, a triple-bottom-line value logic, and a stakeholder value network. The second layer comprises design and capability enablers, including business model innovation, servitization and product–service systems, and digital and data capabilities. The third layer comprises governance and transition mechanisms—collaboration and partnerships, circular value recovery, and adaptive governance—that translate design into sustained operation. The dashed boundary around these layers signals that their interactions are iterative and bidirectional rather than strictly sequential.

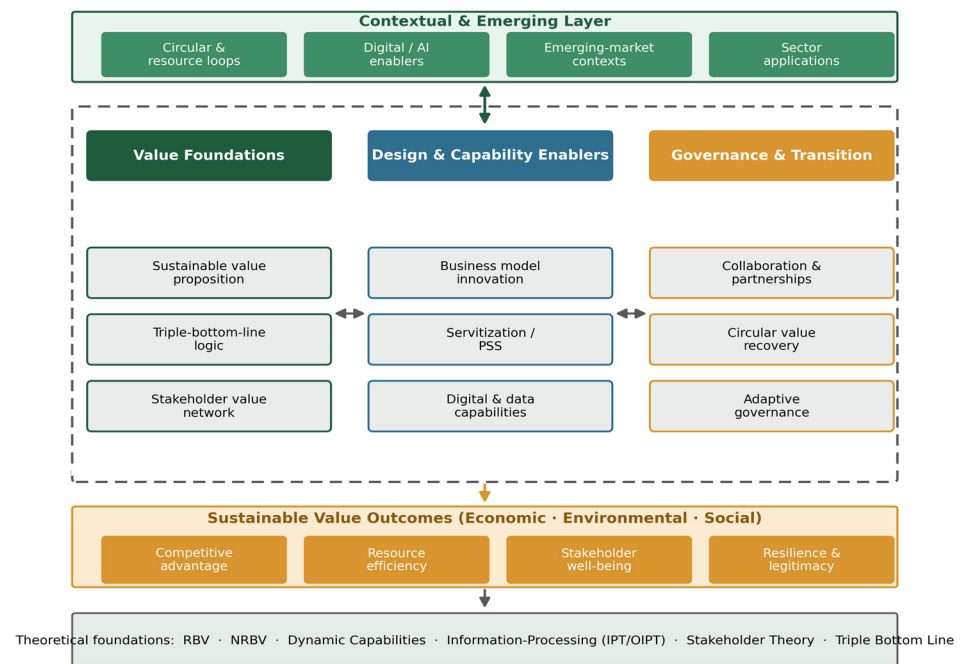


Figure 5. Integrative conceptual framework for sustainable business models, linking theoretical foundations, value-design dimensions, enabling capabilities, contextual themes, and triple-bottom-line outcomes (Source: Authors).

Two further layers frame the model. A contextual and emerging layer—circular and resource loops, digital and AI enablers, emerging-market contexts, and sector applications—shapes how the core layers are configured in practice. At the base of the value architecture lie the sustainable value outcomes the model is intended to produce: competitive advantage, resource efficiency, stakeholder well-being, and resilience and legitimacy, spanning the economic, environmental, and social dimensions. The framework thus links what the field has consolidated (value foundations and design logics) with where it is expanding (digital, circular, and context-specific frontiers), and clarifies the theoretical mechanisms that connect them. Although presented in layers for expository clarity, the framework is not strictly sequential: value outcomes feed back into value foundations and design enablers through organizational learning and adaptation, and governance mechanisms are continuously reconfigured as firms accumulate experience. This system’s perspective—emphasizing feedback loops, learning, and continuous transformation, consistent with the dynamic-capabilities lens introduced in Section 2.3—is reflected in the dashed, iterative boundary shown in Figure 5.

4. Discussion

4.1. Theoretical Implications

The synthesis suggests that SBM research has not converged on a single theoretical core but is better understood as a pluralistic, multi-theoretical domain. From the RBV and NRBV perspectives, sustainability-oriented resources and environmental capabilities are expected to enhance a firm’s ability to convert SBM practices into economic, environmental, and social performance, and the co-evolution of these capabilities creates complementarities that isolated initiatives cannot achieve [48,49]. From a dynamic-capabilities perspective, SBMs are most effective when firms can sense sustainability pressures, seize emerging opportunities, and reconfigure their value-creation logics under uncertainty; adopting sustainability practices without corresponding adaptive governance and supportive organizational design may yield diminishing returns [50–52]. From information-processing

perspectives, digital technologies strengthen SBMs primarily by reducing information asymmetry and improving coordination across value-network tiers rather than by their mere adoption [59]. Read together, these lenses imply that sustainable value is contingent on the synergistic interplay of resources, environmental strategy, adaptive capacity, and information-processing mechanisms, moderated by contextual factors such as regulation and stakeholder pressure. The integrative framework presented in Section 3.4 is theoretical and interpretive: it consolidates patterns identified through qualitative synthesis rather than through statistical testing, and its proposed relationships among value foundations, capabilities, and outcomes require future empirical validation before they can be treated as tested causal claims.

4.2. Managerial Implications

For practitioners, the framework implies that sustainability is unlikely to succeed as a set of isolated initiatives and is better approached as an integrated, multi-layered process linking value foundations, design enablers, governance, and context. Table 5 translates the framework into a managerial roadmap organized around six priorities, from establishing a measurable sustainability baseline to adapting strategies to sector-specific conditions. The roadmap emphasizes defining a value baseline against triple-bottom-line indicators; selecting and combining archetypes and patterns appropriate to the firm's context [10,17]; investing in digital and data capabilities that improve transparency and coordination [58,59]; embedding circular value-recovery mechanisms [22,27]; using structured, multi-criteria evaluation to balance competing sustainability objectives [50]; and aligning governance and collaboration with external regulation, shared-value opportunities, and stakeholder expectations [12,56,68,70].

Table 5. Managerial roadmap for sustainable business model design and implementation (Source: Authors).

Managerial Priority	Indicative Actions	Supporting Concepts/Tools
Define a value baseline	Map current value creation against economic, environmental, and social indicators; identify gaps and uncaptured value.	TBL metrics; TLBMC [14]; value-uncaptured lens [31].
Select and combine archetypes	Choose technological, social, and organizational mechanisms fitting the firm's context.	SBM archetypes [10]; pattern taxonomies [17,21].
Build digital and data capabilities	Invest in analytics, traceability, and platforms to improve visibility and coordination.	AI/ML, blockchain, IoT [58,59]; OIPT.
Embed circular value recovery	Design take-back, reuse, remanufacturing, and closed-loop flows.	Circular business models [22,27,37].
Balance sustainability trade-offs	Evaluate competing objectives transparently across cost, impact, and resilience.	Multi-criteria evaluation; dynamic capabilities [50,52].
Align governance and context	Coordinate with partners, regulation, and stakeholders; pursue shared value; tailor to sector and market.	Stakeholder theory; shared value [70]; collaboration [12,68].

Note: Table 5 translates the conceptual framework in Section 3.4 into prescriptive managerial actions. Several indicative actions draw on theoretical/conceptual literature (e.g., refs. [50,52]) rather than directly on the 30 empirically included studies; the table should be read as a prescriptive translation of the framework, not as a summary of empirical findings from the systematic corpus.

4.3. Regional Application: Sustainable Business Models in Central Asia and Emerging Markets

This section extends the review's findings to the Central Asian context, drawing substantially on sources outside the 30-study systematic corpus (refs. [71–74]) to illustrate the framework's practical applicability. A recurring but under-developed theme concerns the transfer and adaptation of SBMs to emerging-market contexts, and Central Asia offers a particularly instructive setting. Much of the foundational literature was developed in high-income economies, yet the constraints and opportunities of emerging markets differ markedly: institutional voids, informal markets, infrastructure gaps, and resource dependence can simultaneously hinder conventional implementation and create distinctive openings for frugal, inclusive, and circular models [27,61]. Kazakhstan, the largest Central Asian economy, exemplifies these tensions. Its economy remains heavily resource-intensive and coal-dependent, yet national policy—anchored in the Green Economy Plan and a 2060 carbon-neutrality ambition—has begun to reorient firms toward low-carbon and circular value creation, supported by emerging green-finance mechanisms [72]. Studies of industrial regions show that ESG transformation and eco-branding are becoming sources of stakeholder value for resource-based firms [71], while analyses of the oil-and-gas sector demonstrate how circular-economy principles can be embedded at the regional level to reduce emissions and recover value from waste streams [73].

At the enterprise level, circular entrepreneurship is emerging as a vehicle for sustainable value creation, yet small and medium-sized enterprises in Kazakhstan face persistent barriers—limited financing, weak regulatory and institutional support, and low public awareness—that constrain the adoption of circular business models [74]. These findings echo the broader emerging-market literature [27,61] and underscore that the effectiveness of SBMs is contingent on local capabilities and supportive governance rather than on design templates alone. For Central Asia, the integrative framework presented in Section 3.4 can serve as an adaptable template: its layered structure allows managers and policymakers to consolidate value foundations and governance mechanisms—such as ESG disclosure, green finance, and stakeholder collaboration [71,72]—before pursuing capital-intensive digital enablers. This sequencing is well suited to contexts where sustainability institutions are still maturing, and it positions the region's resource-intensive sectors, agri-food systems, and renewable-energy transition as priority domains for context-sensitive SBM design. Empirical research on SBMs in resource-dependent emerging economies thus represents a promising and largely open avenue.

4.4. Limitations and Future Research Directions

Several limitations should be acknowledged. First, as an integrative conceptual review, this study synthesizes the literature qualitatively and does not quantify the field through citation or co-occurrence metrics; complementary bibliometric and topic-modeling analyses, already demonstrated for the SBMI field itself [26] and for adjacent domains [44], could triangulate and extend the patterns identified here. Second, the purposive corpus, although anchored in foundational and recent contributions, is not exhaustive, and adjacent terminologies (for example, ESG- or responsibility-oriented models) may extend the boundaries of the field [15]. Third, the synthesis relies on published conceptual and review work rather than primary empirical testing of the proposed framework. Fourth, screening and full-text eligibility assessment were conducted by a single author without a second independent screener or a formal inter-coder reliability statistic, and no validated risk-of-bias instrument (e.g., MMAT or CASP) was applied; adapting such instruments to a more homogeneous future corpus is a natural extension of this protocol. Fifth, restricting inclusion to English-language publications, while standard practice, likely excludes relevant Russian- and Kazakh-language literature bearing directly on the Central Asian and

Kazakhstani context discussed in Section 4.3, compounding the absence of bibliometric coverage noted above.

These limitations point to a clear research agenda. Future work could empirically test how value foundations, dynamic capabilities, and digital information-processing mechanisms jointly influence SBM performance across sectors and regions, ideally through longitudinal and mixed-method designs. Advanced analytical approaches, including structural equation modeling and partial least squares (PLS-SEM), offer strong potential for examining the relationships among SBM enablers and outcomes. Particular attention is warranted to digital and circular enablers, to governance mechanisms under conditions of data sharing and algorithmic transparency, and to the under-examined dynamics of SBMs in emerging markets—especially resource-dependent economies in Central Asia, where circular and green-finance instruments are expanding rapidly [72,74]. Comparative and longitudinal studies across Central Asian economies could clarify how institutional reform, green finance, and digitalization jointly shape SBM adoption. Such work would strengthen both the theoretical maturity and the practical relevance of the field.

5. Conclusions

This study set out to consolidate a conceptually dispersed field through a structured, theory-informed integrative review of sustainable business model research published between 2008 and 2025. Each of the three research objectives has been addressed. In response to RO-1, the synthesis traced a coherent three-phase trajectory—from foundational triple-bottom-line conceptualization (2008–2014), through archetype- and tool-based design (2014–2018), to a digitally enabled, circular, and resilience-oriented frontier (2018–2025)—showing that the field has matured from defining sustainability as a strategic orientation toward treating it as a capability-driven and information-intensive process. In response to RO-2, the review consolidated the dominant design logics of the field: the archetype taxonomy, the Triple-Layered Business Model Canvas, and pattern-based approaches were shown to form a cumulative design vocabulary, while the contemporary thematic landscape was organized around a central value-creation core and five adjacent clusters of differing maturity, of which circularity and servitization are consolidated and digital and AI-enabled models remain theoretically consolidating. In response to RO-3, these insights were integrated into a layered conceptual framework that connects theoretical foundations, value foundations, design and capability enablers, governance and transition mechanisms, contextual conditions, and triple-bottom-line outcomes.

The contribution of the review is threefold. Theoretically, it moves beyond cataloging definitions and tools by specifying the mechanisms—resource-based, capability-based, information-processing, and stakeholder-oriented—through which sustainable business models are expected to generate value, and by showing how the consolidated core of the field connects with its expanding digital and circular frontier. Methodologically, it demonstrates how an integrative conceptual review can combine the procedural transparency of systematic protocols with concept-centric synthesis and explicit trustworthiness criteria, offering a replicable template for framework-development reviews in adjacent domains. Practically, the framework and the accompanying managerial roadmap translate the literature into an actionable sequence—from establishing a triple-bottom-line value baseline, through archetype selection and capability building, to circular value recovery and adaptive governance—that practitioners can adjust to their sector and institutional setting.

The findings carry particular significance for resource-dependent emerging economies. For Central Asia, and for Kazakhstan in particular, the layered structure of the framework suggests a pragmatic sequencing: consolidating value foundations and governance mechanisms—ESG disclosure, green finance, and stakeholder collaboration—before com-

mitting to capital-intensive digital enablers. This sequencing aligns business-model transformation with the region's maturing sustainability institutions and positions its resource-intensive industries, agri-food systems, and renewable-energy transition as priority domains for context-sensitive application.

Sustainable business model research now stands at an inflection point: its conceptual core is consolidated, its design vocabulary is rich, and its principal open questions are empirical—how value foundations, dynamic capabilities, and digital information-processing mechanisms jointly shape performance across sectors, regions, and time. The framework developed here offers a coherent scaffold for that next generation of longitudinal, comparative, and mixed-method studies. Its central message for scholars, managers, and policymakers alike is that sustainable value emerges not from isolated initiatives but from the deliberate alignment of resources, capabilities, governance, and context.

Author Contributions: Conceptualization, T.K., B.A., A.A., M.B. and R.V.; methodology, T.K. and M.B.; investigation, T.K. and M.B.; writing—original draft, T.K.; writing—review and editing, T.K., A.A., B.A. and M.B.; visualization, T.K.; supervision, R.V. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: No new data were created or analyzed in this study. Data sharing is not applicable.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

SBM	Sustainable Business Model
SBMI	Sustainable Business Model Innovation
BMC	Business Model Canvas
TLBMC	Triple-Layered Business Model Canvas
TBL	Triple Bottom Line
CE	Circular Economy
PSS	Product–Service System
RBV	Resource-Based View
NRBV	Natural-Resource-Based View
DCT	Dynamic Capabilities Theory
IPT/OIPT	Information-Processing Theory/Organizational Information-Processing Theory
AI/ML	Artificial Intelligence/Machine Learning
PLS-SEM	Partial Least Squares Structural Equation Modeling
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Appendix A

PRISMA 2020 Checklist

Table A1 reports the completed PRISMA 2020 checklist [41] for this review, following the editorial request to document compliance in full. Items relating to meta-analytic synthesis (effect measures, statistical heterogeneity, certainty grading) are marked not applicable because this review synthesizes its 30 included studies narratively rather than statistically, for the reasons given in Section 2.2.1.

Table A1. PRISMA 2020 checklist (Source: Authors, adapted from Page et al. [41]).

Section/Topic	Item	Checklist Item	Reported in
TITLE			
Title	1	Identify the report as a review and, where relevant, the specific review type.	Title page (article type: Review); review design specified in Section 2.2.1
ABSTRACT			
Abstract	2	Provide a structured summary covering objectives, eligibility criteria, information sources, synthesis methods, results, and limitations.	Abstract
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Section 1
Objectives	4	Provide an explicit statement of the objectives or questions the review addresses.	Section 1 (RO-1–RO-3)
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria and how studies were grouped for synthesis.	Table 1 (Inclusion, Exclusion rows); Section 2.2.2
Information sources	6	Specify all databases and other sources searched, and the dates of the last search.	Table 1 (Databases, Time frame rows)
Search strategy	7	Present the full search strategy for at least one database.	Table 1 (Search fields, Core search terms rows); Section 2.2.2
Selection process	8	Describe the methods used to decide whether a record met inclusion criteria.	Table 1 (Screening row); Section 2.2.2
Data collection process	9	Describe the methods used to extract or code data from included studies.	Section 2.2.3
Data items	10a/b	List and define the outcomes and other variables for which data were sought.	Section 2.2.3 (concept-matrix coding categories)
Study risk of bias assessment	11	Describe the methods used to assess risk of bias in included studies.	Table 1 (Quality appraisal row)—narrative appraisal during screening; no formal validated risk-of-bias instrument was applied, consistent with a qualitative synthesis (limitation noted in Section 4.4)
Effect measures	12	Specify the effect measure(s) used in synthesizing results.	Not applicable—no meta-analysis was conducted
Synthesis methods	13a–f	Describe the methods used to prepare, tabulate, and synthesize results, including any exploration of heterogeneity.	Section 2.2.3
Reporting bias assessment	14	Describe methods used to assess risk of bias due to missing results.	Not formally assessed; acknowledged as a limitation in Section 4.4
Certainty assessment	15	Describe methods used to assess certainty in the body of evidence.	Not applicable—qualitative synthesis; formal certainty grading (e.g., GRADE) was not used
RESULTS			
Study selection	16a/b	Describe results of the search and selection process, ideally with a flow diagram; report studies that appeared eligible but were excluded, and why.	Figure 1; Section 2.2.2
Study characteristics	17	Cite each included study and present its characteristics.	Section 3 (Findings); included studies are cited throughout the thematic synthesis

Table A1. *Cont.*

Section/Topic	Item	Checklist Item	Reported in
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Table 1 (Quality appraisal row)—addressed narratively at the corpus level rather than per study
Results of individual studies	19	Present results for all outcomes for each study.	Section 3 (thematic synthesis by evolutionary phase, archetype, and topic cluster)
Results of syntheses	20a–d	Describe synthesis results and any assessment of heterogeneity.	Section 3; statistical heterogeneity statistics are not applicable (no meta-analysis)
Reporting biases	21	Present assessment of risk of bias due to missing results for each synthesis.	Not assessed; acknowledged as a limitation in Section 4.4
Certainty of evidence	22	Present assessment of certainty for each outcome.	Not applicable—qualitative synthesis
DISCUSSION			
Discussion	23a–d	Interpret results, discuss limitations, and describe implications for practice, policy, and future research.	Section 4
OTHER INFORMATION			
Registration and protocol	24a–c	Provide registration information, indicate where the protocol can be accessed, and describe amendments.	Table 1 (Registration row); Section 2.2.1—registered with OSF Registries (https://osf.io/8m26v/ , accessed on 1 August 2026) prior to full-text screening; PROSPERO not used (does not accept protocols outside health-related fields); no protocol amendments made after registration
Support	25	Describe sources of financial or non-financial support for the review.	Funding statement (back matter)
Competing interests	26	Declare any competing interests.	Conflicts of Interest statement (back matter)
Availability of data, code, and other materials	27	Report which materials are publicly available and where they can be found.	Data Availability Statement (back matter)

Appendix B

Full Database Search Strings

Table A2 reports the complete Boolean search strings, field codes, truncation, and filters used to query each database, corresponding to the abbreviated core search terms reported in Table 1 (Section 2.2.2). Both databases were searched using the same four core concepts, combined with the OR operator and applied to title, abstract, and keyword fields, restricted to peer-reviewed English-language journal articles published between 2008 and 2025. Database searching was complemented by backward and forward citation snowballing, as described in Section 2.2.2.

Table A2. Full per-database search strings used for systematic record identification (Source: Authors).

Database	Search Field(s)	Full Search String	Filters/Limiters Applied
Scopus	TITLE-ABS-KEY	TITLE-ABS-KEY("sustainable business model*" OR "business model* for sustainable*" OR "sustainable business model innovation" OR "circular business model*")	PUBYEAR > 2007 AND PUBYEAR < 2026; DOCTYPE(ar); LANGUAGE(English)
Web of Science (Core Collection)	TS (Topic)	TS = ("sustainable business model*" OR "business model* for sustainable*" OR "sustainable business model innovation" OR "circular business model*")	Refined by: Document Type = Article; Language = English; Publication Years = 2008–2025

Notes: 1. The asterisk (*) denotes right-hand truncation, retrieving morphological variants (e.g., "model"/"models", "sustainable"/"sustainability"). 2. Searches were run against title, abstract, and author-keyword fields only (Scopus TITLE-ABS-KEY; Web of Science TS/Topic), consistent with Table 1. 3. The combined search returned 300 records prior to de-duplication; the full PRISMA 2020 identification, screening, and inclusion flow is reported in Figure 1 and Table 1.

References

1. Zott, C.; Amit, R.; Massa, L. The business model: Recent developments and future research. *J. Manag.* **2011**, *37*, 1019–1042. [\[CrossRef\]](#)
2. Teece, D.J. Business Models, Business Strategy and Innovation. *Long Range Plan.* **2010**, *43*, 172–194. [\[CrossRef\]](#)
3. Osterwalder, A.; Pigneur, Y. *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*; Wiley: Hoboken, NJ, USA, 2010.
4. Zott, C.; Amit, R. Business model design: An activity system perspective. *Long Range Plan.* **2010**, *43*, 216–226. [\[CrossRef\]](#)
5. Chesbrough, H. Business model innovation: Opportunities and barriers. *Long Range Plan.* **2010**, *43*, 354–363. [\[CrossRef\]](#)
6. Wirtz, B.W.; Pistoia, A.; Ullrich, S.; Göttel, V. Business models: Origin, development and future research perspectives. *Long Range Plan.* **2016**, *49*, 36–54. [\[CrossRef\]](#)
7. Magretta, J. Why business models matter. *Harv. Bus. Rev.* **2002**, *80*, 86–92. [\[PubMed\]](#)
8. Stubbs, W.; Cocklin, C. Conceptualizing a "Sustainability Business Model". *Organ. Environ.* **2008**, *21*, 103–127. [\[CrossRef\]](#)
9. Boons, F.; Lüdeke-Freund, F. Business models for sustainable innovation: State-of-the-art and steps towards a research agenda. *J. Clean. Prod.* **2013**, *45*, 9–19. [\[CrossRef\]](#)
10. Bocken, N.M.P.; Short, S.W.; Rana, P.; Evans, S. A literature and practice review to develop sustainable business model archetypes. *J. Clean. Prod.* **2014**, *65*, 42–56. [\[CrossRef\]](#)
11. Schaltegger, S.; Hansen, E.G.; Lüdeke-Freund, F. Business Models for Sustainability: Origins, Present Research, and Future Avenues. *Organ. Environ.* **2016**, *29*, 3–10. [\[CrossRef\]](#)
12. Schaltegger, S.; Lüdeke-Freund, F.; Hansen, E.G. Business Models for Sustainability: A Co-Evolutionary Analysis of Sustainable Entrepreneurship, Innovation, and Transformation. *Organ. Environ.* **2016**, *29*, 264–289. [\[CrossRef\]](#)
13. Geissdoerfer, M.; Vladimirova, D.; Evans, S. Sustainable business model innovation: A review. *J. Clean. Prod.* **2018**, *198*, 401–416. [\[CrossRef\]](#)
14. Joyce, A.; Paquin, R.L. The triple layered business model canvas: A tool to design more sustainable business models. *J. Clean. Prod.* **2016**, *135*, 1474–1486. [\[CrossRef\]](#)
15. Lüdeke-Freund, F.; Dembek, K. Sustainable business model research and practice: Emerging field or passing fancy? *J. Clean. Prod.* **2017**, *168*, 1668–1678. [\[CrossRef\]](#)
16. Brenner, B.; Drdla, D. Business Model Innovation toward Sustainability and Circularity—A Systematic Review of Innovation Types. *Sustainability* **2023**, *15*, 11625. [\[CrossRef\]](#)
17. Lüdeke-Freund, F.; Carroux, S.; Joyce, A.; Massa, L.; Breuer, H. The sustainable business model pattern taxonomy—45 patterns to support sustainability-oriented business model innovation. *Sustain. Prod. Consum.* **2018**, *15*, 145–162. [\[CrossRef\]](#)
18. Evans, S.; Vladimirova, D.; Holgado, M.; Van Fossen, K.; Yang, M.; Silva, E.A.; Barlow, C.Y. Business Model Innovation for Sustainability: Towards a Unified Perspective for Creation of Sustainable Business Models. *Bus. Strategy Environ.* **2017**, *26*, 597–608. [\[CrossRef\]](#)
19. Kurek, J.; Brandli, L.L.; Frandoloso, M.A.L.; Lange Salvia, A.; Mazutti, J. Sustainable Business Models Innovation and Design Thinking: A Bibliometric Analysis and Systematic Review of Literature. *Sustainability* **2023**, *15*, 988. [\[CrossRef\]](#)

20. Lemus-Aguilar, I.; Morales-Alonso, G.; Ramirez-Portilla, A.; Hidalgo, A. Sustainable Business Models through the Lens of Organizational Design: A Systematic Literature Review. *Sustainability* **2019**, *11*, 5379. [\[CrossRef\]](#)
21. Lüdeke-Freund, F.; Gold, S.; Bocken, N.M.P. A Review and Typology of Circular Economy Business Model Patterns. *J. Ind. Ecol.* **2019**, *23*, 36–61. [\[CrossRef\]](#)
22. Geissdoerfer, M.; Pieroni, M.P.P.; Pigosso, D.C.A.; Soufani, K. Circular business models: A review. *J. Clean. Prod.* **2020**, *277*, 123741. [\[CrossRef\]](#)
23. Pieroni, M.P.P.; McAloone, T.C.; Pigosso, D.C.A. Business model innovation for circular economy and sustainability: A review of approaches. *J. Clean. Prod.* **2019**, *215*, 198–216. [\[CrossRef\]](#)
24. Bocken, N.; Strupeit, L.; Whalen, K.; Nußholz, J. A Review and Evaluation of Circular Business Model Innovation Tools. *Sustainability* **2019**, *11*, 2210. [\[CrossRef\]](#)
25. Sinkovics, N.; Gunaratne, D.; Sinkovics, R.R.; Molina-Castillo, F.-J. Sustainable Business Model Innovation: An Umbrella Review. *Sustainability* **2021**, *13*, 7266. [\[CrossRef\]](#)
26. Pan, L.; Xu, Z.; Skare, M. Sustainable business model innovation literature: A bibliometrics analysis. *Rev. Manag. Sci.* **2023**, *17*, 757–785. [\[CrossRef\]](#)
27. Ali, S.S.; Weber, G.-W.; Tirkolaee, E.B.; Goli, A. Circular Economy Practices in the Context of Emerging Economies. *Sustainability* **2024**, *16*, 1417. [\[CrossRef\]](#)
28. Paul, J.; Criado, A.R. The art of writing literature review: What do we know and what do we need to know? *Int. Bus. Rev.* **2020**, *29*, 101717. [\[CrossRef\]](#)
29. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [\[CrossRef\]](#)
30. Elkington, J. *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*; Capstone: Oxford, UK, 1997.
31. Yang, M.; Evans, S.; Vladimirova, D.; Rana, P. Value uncaptured perspective for sustainable business model innovation. *J. Clean. Prod.* **2017**, *140*, 1794–1804. [\[CrossRef\]](#)
32. Lüdeke-Freund, F.; Froese, T.; Dembek, C.; Rosati, F.; Massa, L. What Makes a Business Model Sustainable? Activities, Design Themes, and Value Functions. *Organ. Environ.* **2024**, *37*, 194–220. [\[CrossRef\]](#)
33. Bocken, N.M.P.; Short, S.W. Unsustainable business models—Recognising and resolving institutionalised social and environmental harm. *J. Clean. Prod.* **2021**, *312*, 127828. [\[CrossRef\]](#)
34. Geissdoerfer, M.; Bocken, N.M.P.; Hultink, E.J. Design thinking to enhance the sustainable business modelling process—A workshop based on a value mapping process. *J. Clean. Prod.* **2016**, *135*, 1218–1232. [\[CrossRef\]](#)
35. Geissdoerfer, M.; Savaget, P.; Bocken, N.M.P.; Hultink, E.J. The Circular Economy—A new sustainability paradigm? *J. Clean. Prod.* **2017**, *143*, 757–768. [\[CrossRef\]](#)
36. Geissdoerfer, M.; Morioka, S.N.; de Carvalho, M.M.; Evans, S. Business models and supply chains for the circular economy. *J. Clean. Prod.* **2018**, *190*, 712–721. [\[CrossRef\]](#)
37. Nußholz, J.L.K. Circular Business Models: Defining a Concept and Framing an Emerging Research Field. *Sustainability* **2017**, *9*, 1810. [\[CrossRef\]](#)
38. Torraco, R.J. Writing integrative literature reviews: Guidelines and examples. *Hum. Resour. Dev. Rev.* **2005**, *4*, 356–367. [\[CrossRef\]](#)
39. Snyder, H. Literature review as a research methodology: An overview and guidelines. *J. Bus. Res.* **2019**, *104*, 333–339. [\[CrossRef\]](#)
40. Cronin, M.A.; George, E. The why and how of the integrative review. *Organ. Res. Methods* **2023**, *26*, 168–192. [\[CrossRef\]](#)
41. Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; Boutron, I.; Hoffmann, T.C.; Mulrow, C.D.; Moher, D. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ* **2021**, *372*, n71. [\[CrossRef\]](#) [\[PubMed\]](#)
42. Webster, J.; Watson, R.T. Analyzing the past to prepare for the future: Writing a literature review. *MIS Q.* **2002**, *26*, xiii–xxiii. [\[CrossRef\]](#)
43. Tranfield, D.; Denyer, D.; Smart, P. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *Br. J. Manag.* **2003**, *14*, 207–222. [\[CrossRef\]](#)
44. Güngör, B.; Taşan, A.S. Sustainable Supply Chains: Bridging Theory and Practice Through Hybrid Analysis. *Sustainability* **2026**, *18*, 5735. [\[CrossRef\]](#)
45. Chatterjee, S.; Bryła, P.; Ciabiada-Bryła, B. Social Marketing for a Healthy Diet: A Systematic Literature Review. *Nutr. Rev.* **2025**, nuaf194. [\[CrossRef\]](#) [\[PubMed\]](#)
46. Gioia, D.A.; Corley, K.G.; Hamilton, A.L. Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organ. Res. Methods* **2013**, *16*, 15–31. [\[CrossRef\]](#)
47. Lincoln, Y.S.; Guba, E.G. *Naturalistic Inquiry*; Sage: Beverly Hills, CA, USA, 1985.
48. Barney, J. Firm Resources and Sustained Competitive Advantage. *J. Manag.* **1991**, *17*, 99–120. [\[CrossRef\]](#)
49. Hart, S.L. A Natural-Resource-Based View of the Firm. *Acad. Manag. Rev.* **1995**, *20*, 986–1014. [\[CrossRef\]](#)
50. Teece, D.J.; Pisano, G.; Shuen, A. Dynamic capabilities and strategic management. *Strateg. Manag. J.* **1997**, *18*, 509–533. [\[CrossRef\]](#)
51. Teece, D.J. Business models and dynamic capabilities. *Long Range Plan.* **2018**, *51*, 40–49. [\[CrossRef\]](#)

52. Bocken, N.M.P.; Geradts, T.H.J. Barriers and drivers to sustainable business model innovation: Organization design and dynamic capabilities. *Long Range Plan.* **2020**, *53*, 101950. [\[CrossRef\]](#)
53. Galbraith, J.R. Organization design: An information processing view. *Interfaces* **1974**, *4*, 28–36. [\[CrossRef\]](#)
54. Freeman, R.E. *Strategic Management: A Stakeholder Approach*; Pitman: Boston, MA, USA, 1984.
55. Fonseca, L. The EFQM 2020 model. A theoretical and critical review. *Total Qual. Manag. Bus. Excell.* **2022**, *33*, 1011–1038. [\[CrossRef\]](#)
56. Nidumolu, R.; Prahalad, C.K.; Rangaswami, M.R. Why sustainability is now the key driver of innovation. *Harv. Bus. Rev.* **2009**, *87*, 56–64.
57. Lüdeke-Freund, F.; Bohnsack, R.; Breuer, H.; Massa, L. Research on Sustainable Business Model Patterns: Status Quo, Methodological Issues, and a Research Agenda. In *Sustainable Business Models*; Aagaard, A., Ed.; Palgrave Macmillan: Cham, Switzerland, 2019; pp. 25–60. [\[CrossRef\]](#)
58. Zhang, J.; Taqi, S.A.; Akbar, A.; Darwish, J.A.; Abbas, S.; Alam, S.; Gao, Y.; Shahbaz, M.Q.; Butt, N.S. Green Innovation in Business: A Comprehensive Bibliometric Analysis of Trends, Contributors, and Future Directions. *Sustainability* **2024**, *16*, 10956. [\[CrossRef\]](#)
59. Teh, D.; Khan, T. Sustainability-Focused Accounting, Management, and Governance Research: A Bibliometric Analysis. *Sustainability* **2024**, *16*, 10435. [\[CrossRef\]](#)
60. Sassanelli, C.; Terzi, S. Circular Economy and Sustainable Business Performance Management. *Sustainability* **2023**, *15*, 8619. [\[CrossRef\]](#)
61. Lewandowska, A.; Cherniaiev, H. R&D Cooperation and Investments concerning Sustainable Business Innovation: Empirical Evidence from Polish SMEs. *Sustainability* **2022**, *14*, 9851. [\[CrossRef\]](#)
62. Harsono, T.W.; Hidayat, K.; Iqbal, M.; Abdillah, Y. Creating Sustainable Innovation Performance: A Systematic Review and Bibliometric Analysis. *Sustainability* **2024**, *16*, 4990. [\[CrossRef\]](#)
63. Tukker, A. Eight types of product–service system: Eight ways to sustainability? Experiences from SusProNet. *Bus. Strategy Environ.* **2004**, *13*, 246–260. [\[CrossRef\]](#)
64. Lewandowski, M. Designing the Business Models for Circular Economy—Towards the Conceptual Framework. *Sustainability* **2016**, *8*, 43. [\[CrossRef\]](#)
65. Santa-Maria, T.; Vermeulen, W.J.V.; Baumgartner, R.J. Framing and assessing the emergent field of business model innovation for the circular economy: A combined literature review and multiple case study approach. *Sustain. Prod. Consum.* **2021**, *26*, 872–891. [\[CrossRef\]](#)
66. Bag, S.; Pretorius, J.H.C.; Gupta, S.; Dwivedi, Y.K. Role of institutional pressures and resources in the adoption of big data analytics powered artificial intelligence, sustainable manufacturing practices and circular economy capabilities. *Technol. Forecast. Soc. Chang.* **2021**, *163*, 120420. [\[CrossRef\]](#)
67. Rua Hernandez, J.C.; Villa-Enciso, E.; Cardona-Acevedo, S.; Valencia, J.; Velasquez Salas, S. Smart Innovation for a Circular Economy: A Systematic Review of Emerging Trends and the Future of AI in the Sustainable Economy. *Sustainability* **2025**, *17*, 5793. [\[CrossRef\]](#)
68. Galvão, G.D.A.; Evans, S.; Ferrer, P.S.S.; de Carvalho, M.M. Circular business model: Breaking down barriers towards sustainable development. *Bus. Strategy Environ.* **2022**, *31*, 1504–1524. [\[CrossRef\]](#)
69. Bigliardi, B.; Filippelli, S. Investigating Circular Business Model Innovation through Keywords Analysis. *Sustainability* **2021**, *13*, 5036. [\[CrossRef\]](#)
70. Porter, M.E.; Kramer, M.R. Creating shared value. *Harv. Bus. Rev.* **2011**, *89*, 62–77.
71. Davidenko, L.; Sherimova, N.; Kunyazova, S.; Amirova, M.; Beisembina, A. Sustainable Economy: The Eco-Branding of an Industrial Region in Kazakhstan. *Sustainability* **2024**, *16*, 413. [\[CrossRef\]](#)
72. Garafutdinova, D.; Tang, D. Green Finance and Industrial Low-Carbon Transition: A Case Study on Green Economy Policy in Kazakhstan. *Sustainability* **2024**, *16*, 7731. [\[CrossRef\]](#)
73. Adambekova, A.; Kozhagulov, S.; Quadrado, J.C.; Salnikov, V.; Polyakova, S.; Tazhibayeva, T.; Ulman, A. Reducing Atmospheric Pollution as the Basis of a Regional Circular Economy: Evidence from Kazakhstan. *Sustainability* **2025**, *17*, 2249. [\[CrossRef\]](#)
74. Zhaksybayeva, N.; Serikkyzy, A.; Baktymbet, A.; Yousafzai, S. Circular shifts: Insights into Kazakhstan’s circular business ecosystem. *Cogent Bus. Manag.* **2024**, *11*, 2431652. [\[CrossRef\]](#)

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.