Rethinking Entrepreneurship Through Sustainability: A Critical Review of Knowledge, Innovation, and Emerging Research Frontiers

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Abstract

Entrepreneurship is commonly viewed as relating to the recognition of opportunities, innovation, the generation of ventures and the capture of economic value. Sustainability disrupts this traditional narrative by challenging not only the value creation of ventures, but also for whom, over what time horizon and at what ecological and social cost. The purpose of this critical review is to examine the foundational theories related to how entrepreneurship relates to sustainability, to synthesize relevant research literatures, and to develop an integrative model for understanding entrepreneurial action for sustainability. Building on seminal work on sustainable development, sustainable and social entrepreneurship, institutional change, business-model innovation and responsible innovation, the article argues that the field has made conceptual progress but is fragmented in terms of labels, levels of analysis and impact measures. There are three primary areas where significant tensions occur: commercial viability vs. public value; technological solutions vs. systemic changes in consumption; and agency of the entrepreneur vs. structural barriers. In addition, the paper asserts that sustainability driven entrepreneurship can most appropriately be conceptualized as a dynamic process where the context influences entrepreneurial agency, agency facilitates sustainability oriented innovation and governance mechanisms serve to bridge value creation and outcome in the long term. The paper also identifies several research themes related to additional positive impact, distributive justice, digital technology, coordination within ecosystems, indigenous and place based knowledge, and the sustainability of environmental benefits. The article provides a conceptual framework from a systems perspective and a set of research propositions to move the discussion beyond the assumption that all green or social ventures automatically lead to sustainable outcomes. It concludes that the central scholarly challenge is not only to explain how entrepreneurs pursue sustainability, but to determine when, how and under which conditions entrepreneurial activity contributes to a just and ecologically viable transition.

Keywords: sustainable entrepreneurship; sustainability-driven innovation; entrepreneurial opportunity; social value creation; circular economy; responsible innovation; sustainable development; business models

1. Introduction

For many years, entrepreneurship has been considered an agent for economic change. Entrepreneurs are able to bring new products or processes to market, combine previously independent assets in unique combinations, upset pre-existing competitive structures and generate organizations capable of exploiting opportunity. However, it is inappropriate to assume that there will be socially valuable effects simply because an entrepreneur's actions result in something new or increased economic output. A venture may generate money but increase resource extraction, transfer environmental costs to communities, or depend on insecure, poorly paid employment. Conversely, a small business might offer limited financial returns, but it could maintain local knowledge, increase access to essential services, or reduce waste. Sustainability thus changes the questions by which entrepreneurship is evaluated.

Several overlapping concepts have been developed in

research, such as green entrepreneurship, ecopreneurship, social entrepreneurship, environmental entrepreneurship and sustainable entrepreneurship. These two concepts both focus on the generation of value above and beyond traditional financial returns; however, they differ significantly in terms of their implications. Green entrepreneurship is generally environment-oriented; social entrepreneurship is oriented toward social value; sustainable entrepreneurship is trying to balance economic, social and ecological issues. Sustainable entrepreneurship is defined by Shepherd & Patzelt (2011) as the creation of products, processes and services which preserve nature, life support systems and communities. This definition is beneficial as it combines those things that need to be sustained with those things that may be generated, rather than viewing environmental protection and entrepreneurial growth as being mutually exclusive.

While the body of research examining the relationship between sustainability and entrepreneurship has made significant progress toward establishing common definitions and frameworks; researchers continue to experience difficulty regarding both conceptual and empirical issues. As such, there continues to exist: first, considerable variability in terminology employed by scholars; secondly, a lack of longitudinal measures of outcomes; thirdly, a tendency to study economic, social and environmental impacts separately in distinct research streams when they are interdependent in practice. More recently, several authors have conducted meta-analyses of the sustainable entrepreneurship literature identifying ongoing inconsistencies among researchers with respect to conceptual clarity, methodologies and assessments of impact (Abbas & Bulut, 2024; Kaushik & Dangwal, 2025). Entrepreneurship researchers have also found that social impacts do not always form part of a unifying account (Caputo et al., 2024).

As a result, this article views sustainability as a lens to view opportunity identification by entrepreneurs, innovation, value creation and responsibilities differently. The article responds to four questions: (1) How have the mainstream intellectual disciplines linking entrepreneurship and sustainability evolved? (2) What does the literature indicate regarding the mechanisms whereby entrepreneurial action contributes to sustainability? (3) What conceptual tensions and methodological limitations limit current knowledge? and (4) what are the most promising research frontiers for theory and practice?

The article makes three contributions: Rather than viewing the field as a set of interchangeable labels, it offers a critical synthesis of major concepts. It proposes a systems-oriented framework linking context, entrepreneurial agency, innovation, governance and outcomes. Finally, it proposes a research agenda and propositions focused on additionality, distribution, time and institutional change. The aim is not to assert that the review is exhaustive of relevant publications, but that it provides a transparent and analytically useful synthesis to guide more focused empirical and systematic reviews.

2. Review approach and scope

This article uses an integrative critical-review approach. This approach is appropriate for a field that draws on multiple disciplines and uses overlapping concepts because the purpose is to compare assumptions, connect theoretical streams and develop a conceptual argument rather than calculate a pooled effect size. The article examines seminal contributions on sustainable development and entrepreneurship; seminal contributions on environmental and social entrepreneurship; research on sustainability-oriented innovation and business models; and recent reviews that outline the development and limitations of the discipline (Anand et al., 2021; Donthu et al., 2021; Gast et al., 2017).

To further organize the literature examined, four complementary lenses were applied: conceptual underpinnings; entrepreneurial opportunity and innovation; business models; institutional environments; and future directions. To facilitate examination of foundational works as well as current trends among researchers, seminal works were included due to their theoretical influence and recent reviews provided insight into current patterns. Therefore, this review represents an interpretive building approach instead of a protocol-based systematic review or bibliometric analysis. While this review does not assert it includes all possible databases searched, nor does it report a reproducible screening count nor a statistically representative sample of all fields represented in the database. If the target journal requires a formal systematic method, including database names, search strings, date limits, inclusion criteria, screening stages and a PRISMA flow diagram, a journal submission should strengthen this section.

It is important for scholarship integrity that these distinctions be made clearly. A critical review can represent a defendable conceptual contribution, but it should not imply its selected literature represents an exhaustive population census. Further, one should not mistake a conceptual synthesis for empirical evidence. The framework and propositions developed below are analytical outputs grounded in the literature; they need testing through qualitative, quantitative, comparative or longitudinal research.

3. Conceptual foundations: from growth to sustainable value creation

3.1 Sustainability as a substantive constraint

Intergenerational responsibility lies at the heart of development in the Brundtland formulation of sustainable development (World Commission on Environment and Development, 1987). Elkington's (1997) triple-bottom-line approach popularized the idea that organizational performance should be thought of in economic, social and environmental terms. The three dimensions are not to be read, however, as fully substitutable. Financial gain is not enough to offset the irreversibility of biodiversity loss. In addition, aggregate economic growth does not provide automatic solutions to either exclusion or equal exposure to environmental harm. Sustainability is about limits, rights, distribution and time - not simply a scorecard (Belz & Binder, 2017).

This realization fundamentally alters the nature of the opportunity itself. While a traditional opportunity can be defined based upon customer need, feasibility, and anticipated financial returns, a sustainability-based opportunity must be viewed based upon the problem(s) it attempts to resolve, the negative impacts it may supplant, the resources it uses, and the populations it will serve. The question is no longer: Is this product greener than an existing alternative in one way? Rather, Are the life-cycle effects of the entire product a true improvement?

3.2 Sustainable entrepreneurship as a distinct but contested field

According to Dean and McMullen (2007), environmental entrepreneurship defines opportunities created by environmental market failure. If pollutants or depletions of natural resources are not priced at their full-cost of production, entrepreneurs can innovate to correct these inefficiencies and generate value from environmental improvements. Likewise, Cohen and Winn (2007) argue that imperfections in the market can lead to opportunities for sustainable entrepreneurship. These accounts make a strong economic case: sustainability problems may signal unmet needs, wasted resources and opportunities for novel market arrangements (Demirel et al., 2019).

Shepherd and Patzelt (2011), however, extend the discussion to the preservation of nature, life support systems and communities in connection with the development of future products, processes and services. This suggests the entrepreneurial gain can be also non-financial. Schaltegger and Wagner (2011) also link sustainable entrepreneurship to sustainability innovation and distinguish entrepreneurial activity according to the sustainability orientation and market impact of the innovation. These contributions help to establish that the field is not solely concerned with firms in environmental markets, but about how entrepreneurial action can change the relationship between economic activity and sustainable development (Muñoz & Cohen, 2018).

3.3 Related concepts and their boundaries

In general, green entrepreneurship is related to environmental protection, cleaner production, renewable energy, resource efficiency or pollution prevention. Social entrepreneurship is about the creation of social value, often in answer to unmet needs or institutional voids (Mair & Martí, 2006). While sustainable entrepreneurship seeks to integrate ecological, social and economic considerations into the development of a company, ecopreneurship tends to focus more on how entrepreneurial innovation responds to environmental concerns. Responsible innovation extends the consideration of innovation further by adding an anticipatory and governance dimension requiring innovators to consider the social desirability, ethical acceptability and societal impact of innovation (Stilgoe, Owen, & Macnaghten, 2013) (Allen & Malin, 2008; Dixon & Clifford, 2007).

These categories are not mutually exclusive and may vary depending on the stage of development of the venture. For example, a business providing solar energy could be described as being green yet pricing-out low-income households. An organization operating as a social enterprise may positively affect the lives of individuals involved with it; however, it may produce goods using processes that have detrimental impacts upon ecosystems. Similarly, while an early-stage company in the circular economy may minimize waste per unit, it may foster increased total consumption. These categories should be considered as tools to evaluate decision-making within a venture rather than guarantees of positive outcomes. The key issue is whether the venture's actions, decisions, incentives, opportunities and accountability mechanisms reflect environmental and social goals.

3.4 Entrepreneurship as a mechanism of change-not a substitute for governance

Institutions and markets do not typically evolve by themselves. Entrepreneurs can explore new approaches or models, demonstrate novel methods of conducting business and facilitate networking. However, entrepreneurs cannot solely resolve all sustainability issues. Large-scale infrastructure related to carbon emissions; inadequate labor laws and regulations; inequality in access to financing; and poor enforcement of environmental policies can hinder the scale-up of potentially innovative businesses or permit unproductive business models to remain profitable. As such, public policy, civil society organizations, investors, educational institutions and community organizations influence the ability of sustainable entrepreneurship to contribute toward achieving sustainability. Success is

contingent upon both the motivations and capabilities of the entrepreneur as well as the system in which they operate.

4. Opportunity recognition and sustainability-driven innovation

Opportunities are not merely located in a neutral marketplace but are filtered through the lens of knowledge, values, networks and institutional context. Sustainability challenges can expose opportunities that were previously overlooked by traditional markets due to externalized costs or limited purchasing power among impacted communities. Repair services, decentralized renewable energy, low-waste food systems, regenerative agriculture, accessible transportation options, water conservation technologies, and products intended for reuse are examples of such opportunities. Such opportunities demand that entrepreneurs perceive value where extant business models perceive cost, uncertainty or weak demand (Anand et al., 2021; Rosário et al., 2022).

Dean and McMullen (2007) argue that environmental market failures lead to entrepreneurial opportunities. But this view has to be extended in two directions. Second, institutional change—new regulations or procurement standards, community norms or financing instruments—creates some sustainability opportunities, and not just the correction of price signals. Second, some benefits are public goods that cannot be completely captured by the venture. Entrepreneurs may therefore need blended finance, cooperative ownership, public procurement or cross-sector partnerships to make a socially valuable innovation viable.

Innovation can happen in products, processes, services, supply chains and business models. Bocken et al. (2014) discuss business-model strategies to reduce resource use and support sustainability, while Geissdoerfer et al. (2017) describe the relationship between business-model innovation and the circular economy. Examples provided above illustrate that an improved technological product does not guarantee success when the underlying model continues to incentivize high levels of material usage. Strategies that promote durability, repairability, sharing, product-service systems, reverse logistics, material recovery can modify how companies capture value (Trapp & Kanbach, 2021; Lüdeke-Freund et al., 2018). However, sustainability innovation does not always lead to transformational outcomes. Technological efficiency can result in reduced resource utilization per unit and lower costs; however, it can also cause an increase in total consumption - a rebound effect. Recycling will not eliminate overproduction; it will merely delay disposal. Improvements in digital platforms can enhance logistics; however, they can also increase energy consumption. As such, researchers should expand their area of study to incorporate the life cycle and broader system of production and consumption beyond the individual product (Doran & Ryan, 2016).

Researchers evaluating innovation quality cannot assess this quality through novelty, patenting, adoption or revenues alone. Researchers must differentiate between technical innovation and sustainability performance and determine whether innovations decrease absolute resource utilization or improve social outcomes the rules that perpetuate unsustainable practices. Furthermore, researchers must examine non-technical innovation by consumers that are as impactful as new technologies.

5. Business models, value capture and the limits of market logic

A company's business model represents how an organization generates, delivers and captures value. Sustainability challenges each of these three elements. There are many ways to generate value through lowered greenhouse gas emissions, improved environmental health, better living standards or providing people with access to basic services. However, the value delivered will depend upon how well the organization uses supply chain systems, working conditions for employees, access to the service and overall infrastructure. Capture of value represents how the organization distributes revenue and other economic benefits, and if they have the capacity to operate profitably without transferring costs to either their workforce, local communities or ecosystem.

According to Bocken et al., (2014), sustainable business models can be developed through four different types of strategies: maximize the use of existing materials and energy, create value from waste generated during production, substitute renewable alternatives to materials, deliver function rather than provide ownership of goods, take responsibility as a steward for sustainability, and promote sufficiency. Each of these strategies fundamentally question the notion that there is only one way to achieve successful business outcomes – i.e., increase sales of new materials. Circular business models may produce value from repair, refurbishment, remanufacture, and reuse of materials. However, the degree of sustainability will ultimately depend on factors including design, transportation distance, source of energy, lifespan of product, and level of substitution for virgin produced products. While a "circular" designation provides assurance that an organization is using sustainable methods in manufacturing processes (Trapp & Kanbach, 2021); it does not guarantee a net positive environmental outcome (Agrawal & Bellos, 2017).

One of the primary issues with sustainable business models is balancing the mission of the organization

with maintaining profitability. Typically, sustainable organizations spend a substantial amount of money on clean technologies prior to generating increased revenue. The organization may also incur additional costs associated with implementing and enforcing certification programs or training employees to work sustainably. As a result, investors prefer faster scalability and predictability in returns; however, eco-friendly outcomes may occur over extended periods or benefit society at large. Thus, this disparity can cause tension in sustainable businesses to compromise their missions, target simpler customer bases or focus on easily quantifiable short-term results rather than less quantifiable long term results. Conversely, this disparity may also create opportunities for patients capital providers, government guarantors, socially responsible investors, cooperative enterprises and procurement contract agreements based on performance related to social and environmental criteria (DiVito & Bohnsack, 2017).

The distinction between value generation and value capture is also important. Organizations may create public value but fail to capture much private value from those outcomes. Alternatively, organizations may generate substantial amounts of private value but fail to generate significant public benefit. Therefore, sustainable entrepreneurship theory cannot assume that a financially successful "green" venture is inherently sustainable nor that an unsuccessful social venture is ineffective. Instead, researchers must consider who gains, who loses economically, who assumes risk economically, and whether any economic gain endures.

Porter and Kramer's (2011) concept of shared value presented opportunities where companies could pursue their competitive interests while advancing social development. Although this concept has had considerable influence on thinking regarding sustainable business models; it should not be presumed that all forms of alignment are beneficial. Some environmentally focused improvements are commercially advantageous; whereas others require regulatory frameworks or collective financing due to inadequate private incentives. Similarly, some social advantages are difficult to monetize; whereas others offer profitable advantages that create negative consequences that cannot be resolved by simply improving efficiency incrementally. Ultimately, a critical perspective recognizes the strategic potential for aligning business objectives and societal objectives as well as recognizing systemic conflicts that necessitate policy decisions.

6. Institutions, ecosystems and the distribution of entrepreneurial capacity

Entrepreneurship has been defined within an environment consisting of finance, skills, infrastructure, regulations, markets, research organizations, societal norms and networks of support. Ventures focused on sustainability have multiple challenges as the environmental and social outcomes may be difficult to monetize. The time required to develop new technology to reach scale, and customer familiarity with alternative options will be issues. Micro- and small-medium sized businesses are most affected by these obstacles due to their limited number of specialized employees, low level of negotiating strength and lower ability to secure affordable funding. The U.N.'s 2024 report on entrepreneurial growth for sustainable development emphasizes the necessity of creating cohesive policies and supportive multi-stakeholders within the framework of digitalization, climate pressure and shifting global supply chain dynamics (UNCTAD, 2024) (Bonfanti et al., 2024; Sarvari et al., 2024).

A central concept that explains why different levels of success occur when the same innovation is introduced into two separate environments is institutional theory. Regulations can establish reliable demand for clean products. Government contracting can serve as an initial marketplace. Education and extension programs can enhance the technical capabilities. Disclosure requirements can minimize information asymmetry. In contrast, the absence of consistent policy, government subsidies for unclean activities, poor compliance and disjointed support programs can weaken the sustainability ventures. Institutions go beyond simply providing a backdrop for business operations; they help identify what opportunities appear plausible and acceptable.

The ecosystem view of entrepreneurial activities also raises questions about inclusion. Resources available for entrepreneurs are unequally distributed across geographic areas, based upon gender, class, ethnicity, disability, educational access and ownership of assets. Venture capital and other forms of financing that require sophisticated financial reporting are typically found in major urban centers. Therefore, small-scale rural enterprises are frequently unable to obtain financing. However, rural enterprises are familiar with local ecosystems, natural resource availability, food systems, craftsmanship, water management and community-specific needs. Sustainable strategies that focus on place should not romanticize historical traditions nor assume that all local traditions are environmentally sustainable; instead sustainable place-based strategies should recognize local knowledge as sources of hypotheses that can be tested collaboratively with local populations (Schaefer et al., 2015).

Knowledge obtained from indigenous peoples and communities has particular relevance when livelihoods exist in direct dependence on ecosystems. An important consideration is avoiding obtaining knowledge from indigenous peoples without

receiving permission, acknowledgement and some form of compensation. Research conducted in collaboration with communities should clearly outline how data will be owned, accessed, who will retain the rights to intellectual property developed during this process and how profits generated through commercializing the results will be distributed. Ensuring such protections are implemented does not represent secondary ethical concerns; they relate to the trustworthiness of the enterprise, its legitimacy and the long-term viability of the enterprise.

Therefore, successful sustainability driven entrepreneurship should be viewed as a relational accomplishment. While an entrepreneur's vision is needed in many situations, it is rarely enough to sustainably achieve economic results. A collaborative environment is needed along with complementary institutions and common infrastructure including measurable criteria for evaluating performance and procedures designed to protect weaker stakeholders from having sustainability related costs transferred to them by stronger entities.

7. Measuring impact: from sustainability claims to credible outcomes

In many ways, one of the biggest challenges facing entrepreneurs seeking to develop sustainable businesses is to reconcile the ambitions articulated within their stated missions with demonstrable achievements of impact. As firms focus on reporting on sales of products, employment generated, numbers of farmers trained or tons of waste collected - these represent productive output metrics however they provide no assurance as to whether those activities translate into lasting results. Training may or may not result in higher incomes for participants; collection of waste provides little guarantee that the materials were handled responsibly once collected; and although jobs have been created, they may still be insecure, low paying, or result in the loss of another source of income. An impact assessment needs to make clear distinctions among activities, outputs, outcomes and the systemic effects produced by the development work (Rodgers, 2010).

An effective assessment of impact starts with articulating a theory of change, i.e., what problem(s) are you attempting to solve via specific means for whom under what conditions and time frame. It should identify a baseline against which potential future changes can be measured; and if possible, identify a counterfactual condition. An evaluation should also examine the unintended consequences of the project. Environmental projects can employ life cycle assessments to measure both positive and negative environmental impacts at each stage of the product's lifecycle: from raw material extraction to disposal. Social programs can utilize a variety of measures including economic security, accessibility, health, worker representation and gendered effects and benefit distribution.

No one measurement will capture all aspects of the intended outcomes of a given program. And even when using aggregate scorecards, the data may mask trade-offs (Donthu et al., 2021).

One of the key concepts in evaluating impact is "additionality" e.g. if a venture asserts that it has reduced greenhouse gas emissions, the questions to be answered are: How much less carbon dioxide is your product related to compared to what would otherwise exist? Does this venture create enough of a difference relative to a viable alternative? If a renewable energy product replaces a traditional fossil fuel based product, then the size of the environmental effect will depend on multiple factors: What is the mix of energy sources used in that area? Is there adequate reliable capacity available? Will users adjust consumption patterns in response to increased availability? If an organization produces new employment opportunities then the evaluators need to assess job quality, displacement and who benefits from the opportunity.

However, establishing additionality is very challenging. Without addressing this issue, sustainability claims run the risk of simply being about assigning cause-and-effect relationships rather than demonstrating evidence. Additionally, time is a factor. A business can generate quick environmental benefits while producing waste down line. Or an organization may expend significant resources up front for long term paybacks. Therefore, longitudinal evaluations are essential. Where randomized controlled trials or quasi experimental designs are unfeasible in a particular situation; researchers may choose to use comparative case study methodology, contribution analysis, process tracing, participatory evaluation or various combinations of research methods. However, the objective here is not to impose a single methodology upon all settings but rather to match the methodologies employed with the types of causality being claimed.

Finally, one of the largest challenges in assessing the success of an entrepreneurial venture designed to achieve sustainability is scaling. While an innovative pilot model can successfully demonstrate environmental or social sustainability in a highly supportive and controlled environment, it may experience serious difficulties when scaled out. Expanding may necessitate entirely new materials, longer supply chains, increased levels of energy required, different forms of labor arrangements or changes in user behavior. The performance of a sustainable venture should thus be evaluated both at the organizational unit level and at the broader level of markets within which it operates. At times, the most valuable contributions made by sustainable

ventures will be through development of shared infrastructure and not through expanding a single company.

8. Critical synthesis and proposed conceptual framework

The framework below synthesises the review's central argument.

Figure 1. A systems-oriented framework for sustainability-driven entrepreneurship

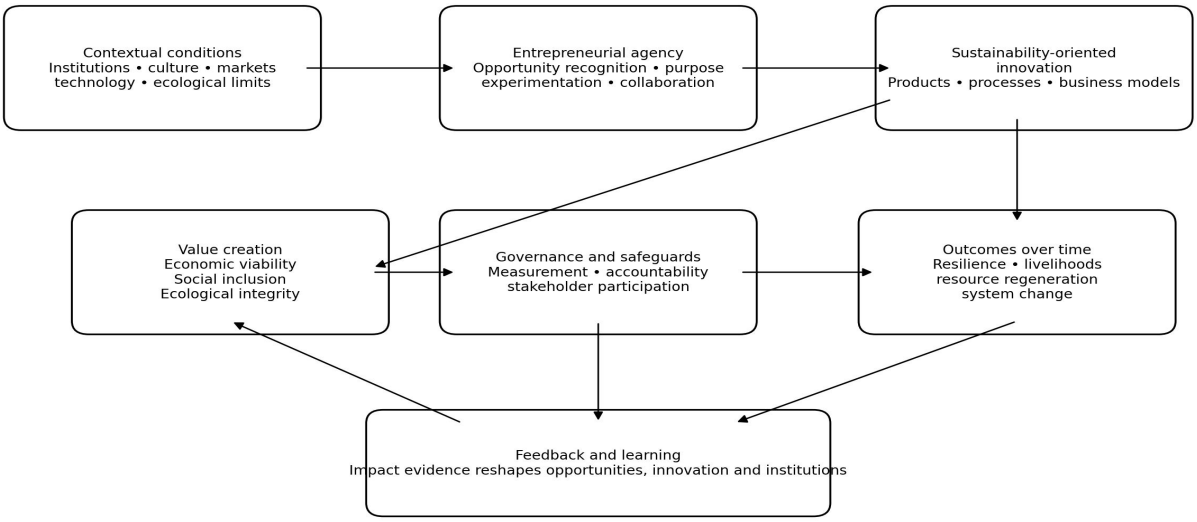

Figure 1. A systems-oriented framework for sustainability-driven entrepreneurship. Source: Author's conceptual synthesis.

The literature reviewed above indicates that sustainability-driven entrepreneurship is best conceptualized as a dynamic system rather than a linear progression from green intention to positive impact. Entrepreneurial agency operates in contextual conditions, it shapes innovation and business models, governance mechanisms affect how value is created and distributed, and outcomes feed back into subsequent learning, opportunity recognition and institutional change. The synthesis is presented in Figure 1 (Belz & Binder, 2017; Muñoz & Cohen, 2018).

The theoretical framework proposed here includes five interconnected components. First, ecological constraints, market structures, institutional rules, cultural practices, infrastructures and technological capabilities represent initial contextual conditions. These conditions establish the urgency with which a problem is recognized and the availability of resources needed to address it. Second, entrepreneurial agency refers to problem framing, opportunity identification, experimentation, leadership, collaborative relationships and willingness to change assumptions as required. Entrepreneurial agency is not equivalent to heroic individualism; it can be distributed among team members, communities and networks.

Thirdly, sustainability-oriented innovations convert identified opportunities into new products, services and processes as well as governance structures and business models. Innovations are evaluated based upon their effectiveness in solving problems they were created to solve and their lifecycle impacts. Fourthly, governance structure and safeguards serve as a linkage mechanism between innovation and accountability. Examples of such structures include transparency around claims made by the organization regarding the social and environmental impacts of their products and services; labor and environmental standards; measures to evaluate impact; complaint resolution mechanisms; and flexibility to make changes in response to data indicating harm. Lastly, the final component involves evaluating outcomes in terms of financial viability; ecological impacts; social inclusion; resiliency; and the potential for systemic change. In addition to being multifaceted; these outcomes often conflict with each other. Therefore, outcomes must be measured and not assumed.

Finally, the framework emphasizes the importance of feedback mechanisms. Evaluation may indicate that a product intended to be sustainable has an excessive material footprint; that benefits are not equitably distributed; or that customers do not utilize the innovative products or services as anticipated. Such findings should prompt organizations to adjust designs for reforms in relevant institutions. Without evaluation mechanisms; sustainability would merely be an arbitrary label representing no actual learning.

The researchers provide five potential propositions for further analysis:

Proposition 1: The link between sustainable-intent entrepreneurial ventures and subsequent actualized sustainable-outcomes is influenced by the extent to which ventures have employed credible measurement tools and stakeholders' mechanisms of accountability.

Proposition 2: The positive sustainability effects generated through innovations are contingent upon the extent to which the business models used by those ventures transform absolute levels of resource use and consumption as opposed to simply relative efficiencies.

Proportion 3: Institutional support and cross-industry collaboration will improve the likelihood that socially driven ventures will successfully translate public value into long term financial viability, without compromising the underlying mission.

Proportion 4: The way that the distribution of risks and rewards among employees, local communities, vendors and consumers influences how the development of a venture correlates to its social legitimacy.

Proportion 5: In addition to examining the intended consequences of a venture's actions, longitudinal and lifecycle analyses can better capture unintended outcomes and consequences than analyses that rely solely on the original intent, immediate output or firm-specific metrics.

These are hypotheses, they represent relationships that can be evaluated through comparative studies using longitudinal datasets, methods combining qualitative and quantitative methodologies, and field experimentation. They can serve to progress the conversation beyond the generalization that entrepreneurship contributes to sustainability, toward the specifics regarding the mechanism producing the outcome under which conditions.

9. Emerging research frontiers

9.1 Digital technologies and the sustainability paradox

Digital technologies (e.g., artificial intelligence, sensors, block chain, digital platforms, data analytics) can assist in tracking resource utilization, predictive maintenance, supply chain visibility and marketplace accessibility. Digital technologies can also consume additional energy, produce e-waste, facilitate increased surveillance capabilities, replicate existing algorithmic biases, and concentrate economic power in fewer hands. Therefore, the focus of the research should transition from determining whether digital technology is being utilized toward assessing their net effect, their distributive implications, and associated governance structures. Comparing life cycle assessments could evaluate whether digital optimization has resulted in decreased environmental burdens or merely shifted those impacts within other geographic regions (Young et al., 2010).

9.2 Circularity, sufficiency and post-growth perspectives

Research on circular economies presents possibilities for transforming production systems based on durability, repairability, recyclability and recoverability (Geissdoerfer et al., 2017), however circularity does not necessarily equate to reduced total material usage if it is pursued in conjunction with ongoing increases in consumption. Future studies should compare productivity-enhanced models with sufficiency-based models that reduce consumption rates while extending product lifespan, prioritizing equitable access to products over individual ownership. As such this agenda may call into question prevailing assumptions about venture valuation and growth as well as necessary if one is to assess sustainability at the systemic level (Young & Tilley, 2006).

9.3 Justice, inclusion and distribution

Sustainability transitions distribute both costs and benefits A low-carbon transition generates new employment but displaces workers in high-carbon industries; Circular supply chains generate employment but expose informal workers to dangerous substances; Environmental improvements raise property values and displace residents. Research should therefore place distributive, procedural and recognitional justice at the heart of sustainable entrepreneurship. Who defines the problem, whose knowledge counts, who owns the innovation and who gets the returns should be looked at.

9.4 Finance, ownership and mission durability

The financing of sustainability ventures continues to be an important area of research. Activities with long-term benefits or that are difficult to monetize can be supported by patient capital, impact investment, public finance, cooperative ownership, community shares and blended-finance instruments. But financial labels don't guaranty any further impact. Researchers should investigate whether funding conditions affect mission drift, reporting practices, risk-taking and the distribution of returns. One could comparatively study ownership structures to see if they affect the durability of sustainability commitments when acquisitions, leadership changes or financial distress occur.

9.5 Methods, data, and causal inference

The field would benefit from more longitudinal research, more transparent reporting, comparative case designs and mixed methods. Studies need to differentiate between stated sustainability

orientation and verified outcomes, and report negative results. Life-cycle assessment can be combined by researchers with data, interviews, worker surveys and community-level indicators. Comparative international research can examine the influence of institutions on outcomes, while process-tracing can illustrate the pathways through which a venture modifies policy or industry practices. It would be beneficial to make search strategy and screening decisions explicit when making systematic claims. Such advancements can help to develop the field from an increasingly large descriptive literature to a more cumulative explanatory literature (Anand et al., 2021; Donthu et al., 2021).

10. Implications for entrepreneurs, policymakers and educators

Developing sustainable entrepreneurship requires an active integration of sustainability into the initial stages of opportunity assessment and venture creation. For example, entrepreneurs can evaluate whether their problem has a significant societal impact, whether the proposed solution creates additional value, whether their supply chain is trustworthy and whether their financial structure relies on externalizing costs. Furthermore, entrepreneurs should set up base line measures, consult with stakeholders and provide channels for employees, suppliers and the community to express concerns. Therefore, broad claims of "being green" or "having an impact" are generally less believable than the transparency of the entrepreneur's limitations.

Therefore, the main implications for policymakers are that promoting start-ups alone will not lead to sustainable entrepreneurship. Policymakers should integrate environmental performance standards into procurement policies, funding for research, public investment in infrastructure and access to financing. Grants and subsidies can support early stage experimentation and clarity around rules and enforcement can protect companies that act responsibly from competition that pass through costs. Public procurement can increase demand for products with lower environmental impacts; however, there are risks associated with overly strict qualification requirements which can exclude small businesses. Additionally, policymakers should extend their support to community-based and informal businesses, especially those owned by women in rural areas which contribute to regional economic development.

Investors and other financial organizations require due diligence regarding the sustainability of a company beyond simply reviewing the company's mission statement. Criteria for investments include consideration of the environmental and social impacts throughout the product lifecycle, the conditions under which employees work, the quality of corporate governance, additionality (i.e., does the project generate added social benefit) and the possibility that the company will lose sight of its original purpose (mission drift). Also, investors should recognize that long term environmental and social returns on investment do not always directly relate to short-term financial results and therefore should avoid investing in growth at all costs when such growth may detract from the overall purpose of the venture.

Universities and entrepreneurship education programs should not only offer an ethics module on sustainability but also incorporate the topic into the broader curriculum. Students can learn how to use systems thinking, life-cycle assessment, stakeholder analysis, impact measurement and responsible innovation in evaluating opportunities and designing business models. Projects that are experiential and involve local businesses and communities can help students to grasp the complexity of sustainability trade-offs. Education should also stimulate critical reflection of the assumption that every social problem is best solved through a market-based venture; in some contexts, public services, regulation or collective ownership may be more appropriate.

11. Limitations and directions for further review

The article is a conceptual synthesis and an integrative critical review, not a systematic review of all the publications in the field. It draws upon foundational literature and recent reviews to frame the discussion on which its conclusions are based. No database search, full screening process or quantitative mapping of publications is reported. It is not, therefore, to be taken as a comprehensive survey of all the research or as proof that the proposed framework has been empirically validated.

Next step would be a systematic review with clear specified protocol! A systematic review to identify studies on sustainable entrepreneurship can be conducted via search engines like Scopus, Web of Science and interdisciplinary databases using combinations of terms such as sustainable entrepreneurship, green entrepreneurship, ecopreneurship, social entrepreneurship, sustainability innovation and impact assessment. The protocol used in conducting the review should include specific publication types, language restrictions, time frames and inclusion and exclusion criteria. The process includes document de-duplication and screening; evaluation of study quality and methodological diversity among studies selected for inclusion. Conducting a bibliometric analysis provides insight into citation patterns and thematic trends over time while performing a content analysis allows for examination of theoretical foundations, cause-and-effect relationships and methods of assessing the impact of sustainable entrepreneurship.

12. Conclusion

Rethinking entrepreneurship through sustainability requires a change of unit of analysis and criteria for success. The question is not simply the capacity of entrepreneurs to create greener products or socially beneficial ventures, but whether entrepreneurial processes can create durable value while respecting ecological limits, improving social conditions, and remaining accountable for harm. There are strong arguments in the literature for considering entrepreneurship as a potential mechanism for sustainable change. This type of systematic review can uncover new opportunities and stimulate the combination of new resources to challenge traditional business models and encourage institutional experimentation. However, as noted in the literature, it is equally possible that entrepreneurial intention, innovation and growth do not necessarily result in sustainability outcomes.

In our article we argue that studying sustainability-driven entrepreneurship requires understanding the interaction of context, agency, innovation, governance and outcomes. Our conceptual framework is based on feedback and accountability. We also emphasize the need to assess additionality (whether the project generates added social benefit), distribution (who receives social benefits), life cycle effects (the impact of a product or service throughout its entire lifetime), and durability (how well social benefits are maintained over time). These concepts allow us to distinguish between real sustainability and symbolic posturing for sustainability; and to examine successful and unsuccessful examples of sustainable entrepreneurship.

To develop further as a field, we will need increased conceptual precision and improved empirical research designs. Researchers need to move beyond generic labels; investigate causal connections; and study the institutional conditions necessary for enabling or constraining sustainable startups. Founders need to build business models that embed social responsibility and environmental responsibility within them. Policymakers need to construct policies that align incentives with safeguards. Educators need to train future founders to think in terms of systems rather than individual markets.

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