

RESEARCH ARTICLE

Sustainable Entrepreneurship in Response to Grand Challenges: What Do We Know and How Do We Move Forward?

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Abstract: The role of sustainability is gaining ground in management and entrepreneurship research especially in the midst of increasing exposure of the society to grand challenges. This paper provides a narrative review of the concept of sustainable entrepreneurship (SE) and juxtaposes it with the concept of grand challenge. The narrative review in turn surfaces a potential framework on how the discourse in both areas can be converged. The framework proposes how grand challenges can be integrated as a critical component in the SE literature. In turn, this paper seeks to inform future conversations on SE both in the theoretical and applied fields to be grounded on addressing grand challenges.

Keywords: Grand Challenges, Sustainable Entrepreneurship, Narrative Literature Review, Sustainability Research Framework

JEL Classifications: L26, L31, Q01

The concept of sustainable development arose from a policy call that dates as far back as 1987 through the Brundtland Report (Pacheco, Dean, & Payne, 2010; Schlange, 2006). The report brought to the fore the need to endeavor on economic practices that meet the needs of the present without compromising the ability of the future generation. This became a precursor for the early scholarly discourse on sustainability, a concept that has been tackled in complementary fields of economics, management, and entrepreneurship. Today, with the increasing exposure of societies to grand challenges (e.g., the vulnerability of societies to specific risks that include natural hazards, unequal development, wars, and displacement, as well as non-

orthodox threats such as terrorism and cybercrimes), there is an even much compelling case for the take up of sustainability-focused discourse. In management and entrepreneurship literature, there is an emerging focus on how such grand challenges can be effectively managed (George, Howard-Grenville, Joshi, & Tihanyi, 2016).

Entrepreneurship, in particular, has been cited as having the potential to address sustainability issues (Dean & McMullen, 2007), to the extent that it is considered a *panacea hypothesis* (Hall, Daneke, & Lenox, 2010). This takes root from the Schumpeterian perspective that through radical innovation, entrepreneurship can be a vehicle for

market transformation (Hagedoorn, 1996; Hall et al., 2010; Hockerts & Wustenhagen, 2010; Shockley & Frank, 2011). If new entrants to the market were sustainability-oriented, it can potentially transform the market practices and legitimize sustainable development as a new standard. Scholars, thus, began to populate the literature on what later grew to be collectively conceptualized as sustainable entrepreneurship (SE), in which they inquire on theoretical and empirical underpinnings of the concept.

In a Special Issue on SE by the *Journal of Business Venturing*, Hall et al. (2010) revisited the past research that tackled sustainable development and entrepreneurship. They opined that while SE is recognized for its potential to transform the market and has emerged as an influential concept for entrepreneurship policy, practice, and theory, there still remains some uncertainty regarding the nature of SE's role, and how it will unfold. They further observed that despite the growing number of studies regarding SE, a majority of them are published outside of the mainstream entrepreneurship journals. Key studies that explore the nature and antecedents of SE remain fragmented across various fields including environmental entrepreneurship, social entrepreneurship, and sustainable management, where a majority of the authors are more inclined to explore the concept of sustainability than entrepreneurship.

Some of these concerns are later addressed in another sustainability-focused special issue on entrepreneurship in the *International Journal of Entrepreneurship and Business Research* (Muñoz, Janssen, Nicolopoulou, & Hockerts, 2018). The collection particularly delineated sustainable entrepreneurship as a discipline that rests at the intersection of "economic results of entrepreneurial actions while simultaneously envisaging sustainable development results" (Muñoz et al., 2018, p. 323). To more concretely define the boundaries of SE, authors in the special issue use the framework put forth by Shepherd and Patzelt (2011) to empirically investigate various aspects of SE. The current state of the literature, thus, sees a convergence in the theoretical grounding on what defines SE, and consequently, opens up avenues for which SE can be empirically and conceptually explored.

Considering that SE as a field is already anchored on stable conceptual definitions, it is interesting to see how the field will develop simultaneously with emerging societal issues, that is, grand challenges. In that regard, this paper inquires how SE as a research field can inform how grand challenges can be addressed. Due to the relative newness of grand challenges in the scholarly discourse of organization, management, and entrepreneurship studies, and thus the sparseness of literature that brings together SE and grand challenges together, a narrative approach is used to review both concepts and to propose a working framework that surfaces key points on how they may be linked. To do this, the metaphor of problem-solution is implied, where grand challenges, on the one hand, are considered to be the problem that needs to be addressed, while SE, on the other hand, are considered to be potential solutions. In reviewing both literatures, key points in relation to problem and solution attributes are given attention. In so far as grand challenges are concerned, the objective was primarily to understand what is known about it, what makes it different from other types of problems, and some key examples of challenges. Meanwhile, for SE, the focus of the literature search related to understanding key definitions in order to see how they may be linked with grand challenges, the motivations and actors behind SE, and how the environmental context of SE works. This paper outlines key studies in the SE literature and juxtaposes it against grand challenges with the objective of surfacing the role that SE can play in tackling grand challenges. Table 1 below summarizes the approach to the narrative literature review, which also influenced the search strategy of related literature.

This paper is consequently divided into the following sections: (a) a review of conceptual definition of SE against a review of how grand challenges are currently understood, (b) a review of the actors behind SE, that is, the "sustainable entrepreneur" who is poised to address grand challenges; (c) a description of the factors seen at the environmental contexts of SE, and finally (d) a discussion of a proposed framework that can help inform how to more tightly link SE with the grand challenges literature.

Table 1: Approach to narrative literature analysis - juxtaposition of key

Problem Narrative: Grand Challenges	Solution Narrative: SE
What is the problem? - Complexity and boundlessness of grand challenges - Presence of social and environmental scope, in addition to profit angle (Eisenhardt, Graebner, & Sonenshein, 2016; Ferraro, Etzion, & Gehman, 2015; George et al., 2016)	- Defining SE as combination of both economic and non-economic purposes - SE as inherently social, environmental, and profit oriented (Dean & McMullen, 2007; Gibbs, 2009; Hall et al., 2010; Schlange, 2006; Shepherd & Patzelt, 2011; Tilley & Young, 2009)
Who is likely to solve the problem? - Motivations beyond profit (George et al., 2016)	- Getting to know the sustainable entrepreneurs and their motivations (Gibbs, 2009; Hockerts & Wustenhagen, 2010; Linnanen, 2002; Schaltegger & Wagner, 2011; Walley & Taylor, 2002)
How can grand challenges be addressed, i.e. what are the surrounding conditions of the context? (Eisenhardt et al., 2016; Ferraro et al., 2015; George et al., 2016)	- Understanding the dynamics on how SE can be used to address the challenges, i.e. what is the environmental context? (De Clercq & Voronov, 2011; Fischer, Mauer, & Brettel, 2018; Majid & Koe, 2012; Muñoz et al., 2018; Spence, Ben Boubaker Gherib, & Biwole, 2011)

What We Know So Far: Sustainable Entrepreneurship and the Grand Challenges We Face

Entrepreneurial Opportunities for Sustainability and Grounding the Meaning of SE

Scholars argue that the opportunity for SE is derived from existing market failures (Cohen & Winn, 2007; Dean & McMullen, 2007). This runs counter to the traditional theory from the environmental and welfare economics that market failures prevent entrepreneurial actions from resolving environmental problems (Dean & McMullen, 2007). Instead, market failures tend to stir the opportunistic nature of entrepreneurs and are likely to motivate them to exploit such market gaps. Dean and McMullen (2007) looked closely at how specific market failures enable entrepreneurs to locate opportunities, and subsequently proposed a typology of entrepreneurial opportunities. They identified market failures to include public goods, externalities, monopoly, imperfect government intervention, and imperfect information. The authors tied their conceptualization of the SE typology using observations from environmentally-oriented entrepreneurs as examples:

1. As regards to public goods, entrepreneurs locate opportunity in buying rights for previously non-excludable goods. Non-excludability, by its nature, can engender overuse when the public good is rivalrous as it gives individuals

the incentive to exploit the resource as quickly as possible, causing faster depletion of resources and a higher likelihood of environmental degradation. This is termed *coasian entrepreneurship*.

2. As regards to externalities, entrepreneurs locate opportunity in decreasing transaction costs. Environmental degradation, for example, can result as a cost to the exchange created by market incumbents in producing goods that produce carbon emissions. Entrepreneurs can reduce such costs by establishing or modifying institutions, as evidenced by examples like the Chicago Climate Exchange which was created as a marketplace for carbon emission credits. This is termed *institutional entrepreneurship*.
3. As regards to monopolies, entrepreneurs locate opportunity in providing alternative product and service sources at competitive prices. For example, the monopolistic hold of existing large corporations in power distribution can be an opportunity for entrepreneurs who can overcome market power and bring to the mass market alternative sources of energy at fairly competitive prices. This is termed *market appropriating entrepreneurship*.
4. As regards to government intervention, entrepreneurs locate opportunity in the modification of government subsidies, taxes, and other economic incentives through political strategies. This kind of entrepreneurship seeks

to motivate changes to government incentive structures by means of lobbying, which is sometimes exhibited by entrepreneurs who undertake environmental causes. This is termed *political entrepreneurship*.

5. Lastly, as regards to information asymmetry, entrepreneurs locate opportunity in brokering information, whether the gap in information is present among consumers or producers. On the one hand, environmental entrepreneurs can reduce environmental degradation and capture value by discovering methods of production that address environmental issues or by marketing environmentally superior products to underserved environmental market niches. This is termed *producer-focused informational entrepreneurship*. Meanwhile, entrepreneurs can also exploit opportunities by enhancing customer knowledge of product or service attributes. Environmental concerns can be highlighted by this means. This is termed *customer-focused informational entrepreneurship*.

While market failures provide opportunities for entrepreneurs to exploit, it does not necessarily follow that the opportunities arising from them will actually benefit the environment and society. It is clear that entrepreneurship can likely exploit opportunities where market failures exist, but whether the entrepreneurs that discover such an opportunity is oriented towards sustainability goals or not is another question altogether. What defines SE, however, is the intention of sustainability, which is ultimately captured in the goal orientation of the entrepreneurs (Dean & McMullen, 2007).

To understand why and how an entrepreneur intends their goal orientation towards sustainability requires an understanding of what sustainability entails. To this end, Shepherd and Patzelt (2011) defined what is to be sustained and what is to be developed. They acknowledged that the various fields from which sustainability have been tackled contribute to the concept of SE. Yet, consistent with the observation of other scholars (Dean & McMullen, 2007; Hall et al., 2010; Schaper, 2002), Shepherd and Patzelt (2011) also found that most studies about economic actors that engage in sustainability practices address the concept of sustainability more than entrepreneurship.

Grounding the concept of SE within the field of entrepreneurship, thus, became imperative. Drawing on three different fields of economics, institutional theory, and psychology, Shepherd and Patzelt (2011) developed a meta-theory for defining SE. They argued that SE exists at the intersection of goal orientation to economic gains (i.e., profit and growth), on the one hand, and goal orientation to non-economic gains, which ultimately encompasses sustainable development (i.e., sustenance of nature, life support systems, and community), on the other hand. SE is thus defined as activities that are “focused on preservation of nature, life support, and community in pursuit of perceived opportunities to bring into existence future products, processes, and services for both economic and noneconomic gains” (Shepherd & Patzelt, 2011, p. 142). Unlike most other studies on SE, this working definition does not distinguish between environmental orientation and social orientation of the enterprise, given that both forms of entrepreneurship contribute to sustainability goals.

To an extent, social and environmental entrepreneurship have grown as distinct literature streams on entrepreneurship (Tilley & Young, 2009). In fact, two varying perspectives within SE are evident—the environmental-centric approach to sustainable development and the inclusive approach to sustainable development. The first perspective considers social entrepreneurship distinct from a specific type of SE, that is, environmental entrepreneurship, because this type is said to be mission-driven (Schlange, 2006), and the goal to create social value overpowers the goal to create economic value. Meanwhile, other scholars acknowledge that both environmental and social entrepreneurship are positively contributing to sustainable development, and could, therefore, be both subsumed under the banner of SE. The attempt to converge the literature will not depend on whether the entrepreneurs pursue social or environmental goals because both are an inherent part of what needs to be sustained. Instead, it will depend on the underlying motivation of the entrepreneurs to simultaneously pursue economic and non-economic goals. While both social and environmental entrepreneurship are initially perceived as distinct because of their different historical trajectories, the underlying motivations for the activities are very similar. For this reason, it seems it is valid to call for a convergence of the currently rather independent literature (Gibbs, 2009).

The distinction is therefore not to be made at the level of whether they contribute social or environmental value but at the level of whether they contribute additional value beyond economic goals.

Finding Additional Value in Addressing Grand Challenges

Grand challenges, as a term, encapsulates specific barriers, which, if addressed or removed, will solve an important societal problem and consequently have a global impact due to widespread implementation (Eisenhardt et al., 2016; George et al., 2016). They are complex, often with unknown or yet-to-be-discovered solutions, and intertwined technical and social elements (Ferraro et al., 2015; George et al., 2016). Some of the defined examples of grand challenges include tackling poverty, climate change, overconsumption of natural resources that can speed up environmental overshoots, pandemics, and unintended consequences brought about by the advancements in the field of science and technology.

Solving grand challenges require novel and unconventional approaches to tackle their evolving mix of technical and social elements (Eisenhardt et al., 2016). On that note, grand challenges are ripe with opportunities for SE to address. A converging point of grand challenges is that they encompass varieties of problems that are social and environmental—and given the tight intertwining of both problem classifications, the link between SE and grand challenges is much more straightforward.

Ultimately, when SE is targeted towards addressing grand challenges, there is a much clearer picture regarding how it can create a market that is geared towards finding market opportunities to solve real social problems, as opposed to merely seeking opportunities to create economic value.

They Who Can Solve Grand Challenges: The Sustainable Entrepreneur

Sustainability entrepreneurs differ from “more conventional entrepreneurs” (i.e., those who only seek to create economic value) in their organizing logics (Gibbs, 2009). Organizing logics, in this case, can be defined by the following: first, the personal orientation of the entrepreneur against existing structural influences (Walley & Taylor, 2002); second, the level of prioritization of entrepreneurs in relation to their sustainability goals against their envisioned market

effect (Schaltegger, 2002); and third, the motivations of the entrepreneur in their desire to change the world against their economic objective (Linnanen, 2002). All these frameworks to understand sustainability entrepreneurs provide a common argument for the need to acknowledge the orientation and motivation of the entrepreneur to include non-economic goals in their entrepreneurial ventures. Moreover, they also acknowledge that the inclination of entrepreneurs to non-economic goals does not exist in absolute, that is, sustainable entrepreneurs do not act as “lone heroes” that automatically intend sustainability goals for the purpose of contributing to their respective society (Gibbs, 2009). Indeed, some entrepreneurs prioritize sustainability over economic goals, but this does not necessarily mean completely abandoning their economic goals. Meanwhile, other entrepreneurs give balanced attention to their economic and non-economic goals. Motivation is one point, but it is, in turn, nurtured by the external context of the entrepreneur, which Gibbs (2009) argued to be crucial points that encourage or discourage the realization of SE.

Like Gibbs (2009), Schaltegger and Wagner (2011) also drew upon the importance of understanding what it means to be a SE. They argued for instance that SE is largely seen as an individual endeavor because environmental and social preferences are largely personal. They complemented the discourse on conceptualizing sustainable entrepreneurs by identifying who they are in the market, what form they take, and which of them are likely to bring about sustainability innovation under specific conditions. They argued further that ventures emerging from SE are forms of sustainable innovation that can either be compensatory (e.g., those that provide sufficient private benefits and compensate negative social effects, and those that provide positive social effect that makes low private benefit justifiable), or radical (e.g., those that equally provide positive private and positive social benefits). In a way, the first type is reminiscent of the Kirznerian perspective to entrepreneurship, while the second embodies more Schumpeterian perspective (Bostaph, 2013; Cromer, Dibrell, & Craig, 2011; Larson, 2000; Shockley & Frank, 2011) products and markets distinguishes it as an area of entrepreneurial opportunity and a force of ‘creative destruction’ as defined by economist Joseph Schumpeter (1934).

Relatedly, sustainable entrepreneurs can either be start-ups or existing institutions. Hockerts and

Wustenhagen (2010) and Schaltegger and Wagner (2011) argued that the most radical forms of sustainable innovation are undertaken by new entrants, while existing institutions are more likely to undertake compensatory innovation in relation to sustainability because of certain constraints. However, both players complement one another in that new entrants face the liability of newness, which existing institutions have the privilege to. Hence the authors conceptualized a process of enacting SE that begins from the core motivation of an entrepreneur, which is enacted in some form of radical innovation, and ultimately brought to the mass market by existing institutions. Existing institutions are best in consolidating radical forms of sustainable innovation from new entrants to a mass market—where startups initiate radical sustainable innovation, existing institutions can become fast second markets. Schaltegger and Wagner (2011) argued that some form of convergence and interaction between small firms and big firms are important to enable sustainable entrepreneurship. This requires some reflection on the space or context in which that interaction takes place, as well as the underlying factors that condition such interaction.

Environmental Context of SE: The Space Where Interaction Takes Place

The environmental context where SE is enacted is assumed to also be the space where existing institutions and new entrants that espouse sustainability interact with one another. The previous sections described the source of opportunities as well as the attributes of the entrepreneurs that enact SE as separate concepts. The contemplation on what it means to be a sustainable entrepreneur and what form they take naturally led to a consideration of the environmental context where they operate. Indeed, the opportunities detected from the market failures do not automatically translate into an exploitative behavior of the entrepreneur. Moreover, even as the entrepreneur decides to exploit such opportunities, it does not necessarily mean that the resulting venture contributes to sustainability. To this end, specific factors have been put forth to explain what happens at the level of entrepreneur, which so far include motivation, orientation to sustainability, and the form of innovation they espouse based on their size and length of time in the market. It was also argued above that grand challenges can readily become motivational factors for sustainability-oriented

entrepreneurs. However, even with a motivation grounded on addressing grand challenges, there is no guarantee that they will stay in the market. For example, a study confirms that sustainability-oriented goals by entrepreneurs at the start-up stage do not necessarily remain unchanged over time. This means that the goals of sustainable entrepreneurs, that is, motivations and intentions that are related to addressing grand challenges, are not necessarily stable over time (Fischer et al., 2018). Interestingly, social and ecological problems, which often trigger the development of venture ideas in early stages of sustainability-oriented entrepreneurs, become much less relevant over the later stages of the venture (Fischer et al., 2018; Muñoz et al., 2018).

Spence et al. (2011) argued that successfully bringing SE to the mass market is contingent upon the cultural perception of the organization on sustainability—which is manifested in multiple levels of individual perception, firm perception, and the external context. The key argument is that sustainability must be culturally present on all three levels. Both the individual and firm level are consistent with the arguments of those who have worked on conceptualizing what drives a sustainable entrepreneur, in that they also point to motivation, commitment, and orientation. As to the contextual level, they argued that context embeds the cultural perception of the organizations to sustainability, which then shapes the likelihood of the mass market to adopt sustainability as a norm. Using a comparative analysis of sustainable enterprises in developing and developed countries, they found that entrepreneurial will is not enough to bring about SE. Instead, contextual factors such as socio-cultural specificities and institutional realities can be inductive to the adoption of sustainability. In another study that endeavored on a framework for sustainable development using the Triple Bottom Line framework, Majid and Koe (2012) also added culture as an important aspect of the context upon which sustainable development is anchored on.

Granting that culture is part of the context that moderates the likelihood of SE to come about, it is still important to understand how various players that espouse sustainable development interact with one another. As briefly discussed in the section on SE, Hockerts and Wustenhagen (2010) modeled how incumbents and new entrants engage in SE by using the metaphor of David and Goliath. They describe

the “Davids” as the new, often smaller entrants to the market, who undertake Schumpeterian type of sustainable innovation, and the “Goliaths” as the larger, existing institutions in the market, who may also be undertaking sustainable innovation, but using a more incremental, arbitrary, Kirznerian approach. Whether the enterprise undertakes radical or incremental innovation is an important defining factor that distinguishes SE from sustainable management (Hockerts & Wustenhagen, 2010), as this, in turn, will define the nature of their interaction. They argued that both the Davids and Goliaths interact with one another in a co-evolutionary manner, where both can move the transformation to sustainability. Where the Davids proactively pursue sustainability goals as a disruption to transform the market, the Goliaths reactively pursue sustainability goals to adapt to the new disruption. Their argument implies that the interaction among the actors plays a role in transforming the environmental context of the market. They conclude it would otherwise be difficult to understand sustainable transformation because then the Davids get stuck in niche markets, while the Goliaths merely react to cost pressures.

Tying these arguments together, it can be said that the sustainable transformation of the market can also entail a process of legitimizing the concept derived from both the interaction of the actors and some socio-cultural factors. De Clerq and Voronov (2011) demonstrated how the legitimacy that entrepreneurs derive from balancing sustainability and profit could be explained using the metaphor of *doxa* and *habitus*. Derived from the sociological work of Pierre Bourdieu, *habitus* is the bundle of resources, that is, encompassing economic, social, and cultural configurations, that an individual carries within as it enters an environment, while *doxa* is the set of rules in a particular field that lends possibilities of what can be sayable and thinkable, that is, the “universe of possible discourse” (Bourdieu, 1986). De Clerq and Voronov (2011) posited that an entrepreneur whose *habitus* is characterized by sustainability and profit meets the *doxa* of the environment. Thus, in conceptualizing how the legitimacy of SE comes about, it is crucial to factor in the embedded agency of the entrepreneur in the contextual environment it navigates.

How Do We Move Forward: Grand Challenge and Sustainable Entrepreneurship

The discussions above revisited the core studies that somehow shaped the concept of SE. As an emerging field, SE has been studied using varying perspectives of sustainability management, economics, institutional theory, psychology, sociology, as well as varying forms of entrepreneurship including environmental entrepreneurship and social entrepreneurship. To date, while the literature is growing, studies remain fragmented. As a result, SE remains to be a topic that is used as an application area for studying more established concepts like innovation, process, market failures, and environmental and social entrepreneurship. SE has yet to establish a “home” where a research agenda is devoted to understanding its nature and attributes. Indeed, Hall et al. (2010) remarked that the core journals where most works on SE are published are not core entrepreneurship journals. For example, most of the literature are found in sustainable development journals like *Greener Management Journal*, *Business Strategy and Environment*, and *Journal of Cleaner Production*—where of the three, only the *Journal of Cleaner Production* is listed in Journal of Citation Reports (Hall et al., 2010). Positioning SE under the flagship of entrepreneurship only started to gain ground with the special issue on SE in *Journal of Business Venturing*, where the editors expressed hope that this initiative would start to fill the void in the literature that tackles the intersection of sustainable development and entrepreneurship (Hall et al., 2010). The recent publication of another special issue in the *International Journal of Entrepreneurial Behaviour and Research* (Muñoz et al., 2018) contributes to more specifically defining the conceptual boundaries of what SE means. As a result, the concept of SE can be linked with tackling grand challenges.

In an aim to contribute to the discourse on how grand challenges and SE come together, this paper presents an initial convergence framework to systematically study SE in relation to grand challenges. This was done by revisiting the literature using a thematic approach that looks at where opportunities for SE come from, what motivates the initiation of SE (i.e., section on market failures, and grand challenges as a source of social value creation), who enacts the identified opportunity

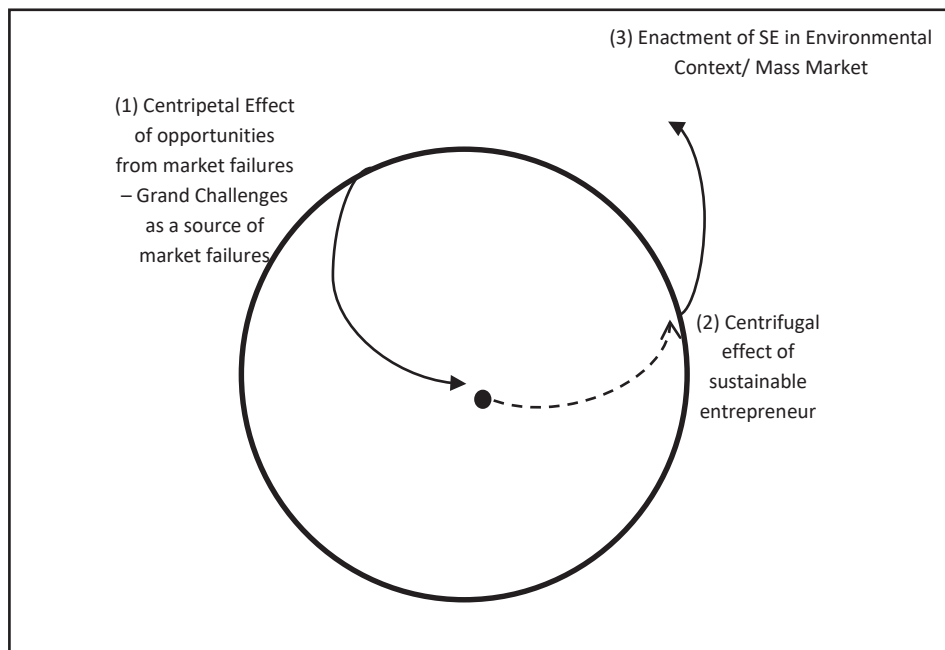


Figure 1: Proposed convergence framework for SE

Source: Conceptualized by authors given the key points in the literature

(i.e., section on sustainable entrepreneur), and how that opportunity is subsequently brought in the mass market (i.e., section on environmental context). Figure 1 links all three themes in a framework that seeks to converge the literature. Specifically, the following are posited:

1. Grand challenges provide a centripetal effect on the entrepreneur. Within this context, future studies can focus on the process by which the entrepreneur sees the opportunity to address a market gap in sustainable development. What kind of opportunities that address sustainable development arise from such grand challenges? Can we point to empirical or case studies that show how grand challenges affect the orientation and motivation of the entrepreneur?
2. The entrepreneur, which is a recipient of the centripetal effect, enacts the perceived opportunities in a way that accounts for the pursuit of both economic and non-economic goals. The process of enactment can be characterized as having a centrifugal effect that is targeted to the market incumbents and can also spill to the environmental context of SE. Here, studies can continue to evolve the concept of a sustainable entrepreneur.
3. Finally, the enactment of SE occurs when the sustainability-driven ventures reach the mass market, which is a space where market incumbents meet and interact with sustainable entrepreneurs. This space is regulated by existing socio-cultural norms, which can be transformed depending on how new entrants that espouse radical forms of sustainable innovation interact with market incumbents. Here, SE can be explored regarding the process by which legitimization of the concept of sustainability is achieved and adopted by the mass market, what kind of innovation sees itself through the mass market, and the conditions that foster positive interaction among the new entrants and the existing institutions.

Conclusion

This paper proposed a convergence framework for SE within the context of tackling grand challenges. Indeed, while sustainable development sparked an interest in both the academe and the industry, most of the conversation has so far been fragmented across various fields. The proposed convergence framework above provides some general themes that can be

explored more specifically through conceptual and empirical studies. What is special about this proposed framework is that it shows clear links among the general themes, which previously remained fragmented.

Of course, this paper is not without limitations. In the future, it might be helpful to use a systematic review approach to the literature to develop a more specific research agenda per category mentioned above. Note that the grand challenges literature is currently evolving, and it has yet to be populated with more empirical and conceptual studies. For this reason, undertaking a systematic literature review would have not been an ideal undertaking at the time that this review was undertaken. Instead, focus was given on how grand challenges and SE may be linked with one another, and how, consequently, grand challenges may be an angle by which SE scholars may direct their attention to. Amid all this, it is not the intention of the paper to imply that SE is the panacea to grand challenges. Instead, it is one of the many ways in which grand challenges may be addressed.

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