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The role of entrepreneurs in advancing sustainable lifestyles: Challenges, impacts, and future opportunities

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Abstract

This paper examines the role of entrepreneurs in advancing sustainable lifestyles (SLs) to address climate change and social inequity. It is based on empirical study of eight U.S.-based sustainable entrepreneurs, focused on reducing material consumption. While business has a key role to play, many large companies are unwilling to promote SLs as this is contrary to their current business models which are focused on growing consumption and sales. This presents an opportunity for entrepreneurial companies with innovative business models who are passionate about sustainability and social impact, and better positioned to take risks and innovate. The research examined emerging business models for advancing SLs, key success factors and challenges reported by the entrepreneurs, the social and environmental impacts of their actions, and the future opportunities for scaling up such practices.

The study found that entrepreneurs are well positioned to address simultaneously environmental and social issues, however, they lack resources to effectively measure these impacts to demonstrate an overall positive benefit and strengthen their value proposition. Promoting green attributes alone is not enough to change the behavior of most consumers. It is critically important to emphasize other benefits such as a product/service quality, time or cost savings, or social impact. Social media, formal and informal sustainability networks, IT, sustainability policies, and consumer awareness are key to developing viable business models and competitive strategies that are difficult to replicate. The study found that sustainable entrepreneurs often face "costly" sustainability actions and lack the power to change "the rules of the game"; for this they need to collaborate with other key stakeholders, including NGOs, policy makers, and progressive companies. Based on the research findings the author proposes a new framework for the role of sustainable entrepreneurs as civic and political actors who not only offer innovative products and services, but help educate and influence key stakeholders, develop informal sustainability ecosystem, and thus create momentum for policy changes.

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1. Introduction

Following the Paris Agreement in 2015, many cities and nations globally have taken steps to achieve substantial cuts to their greenhouse gas (GHG) emissions by focusing on major sources of emissions: electricity, housing, and transportation. Yet, global carbon emissions have continued to rise reaching a record of 36.8 billion tons in 2019 (Mooney and Dennis, 2019), before sharply declining due to the Covid-19 pandemic (Le Quere, 2020). One reason is that policymakers' ambitious plans do not account for indirect emissions closely aligned with lifestyles, such as the energy embodied in producing the food, buildings, or consumer goods and services made outside a city or a state's boundaries (so-called consumption-based emissions) (Mont et al., 2014; Brown and Cohen, 2019; Southerton and Welch, 2019). A recent study in Oregon, United States, showed that while sector-based GHG emissions in the state increased 10% between 1990 and 2016, consumption-based emissions were up 42% over the same period (Brown and Cohen, 2019). Such outsourcing of emissions is not just creating the illusion of making progress, but it is also an issue of equity and justice, as more affluent households have greater carbon footprints. Fifty percent of the world's GHG emissions have been attributed to the richest 10% (Southerton and Welch, 2019).

Decarbonization and dematerialization of existing lifestyles and services, however, do not go fast and deep enough. Research has shown that technological innovation alone cannot help addressing climate change (Alfredsson et al., 2018; Cohen et al., 2017). There is
an urgent need to lower the consumption of material goods, such as living in smaller homes, buying fewer disposable goods, consuming less red meat, and driving and flying less. To reach an 80% reduction of a city's GHG emissions or a carbon neutrality (such as the City of Boston’s goal for year 2050) will require more structural changes in the way people live and work.

Changing consumer lifestyles, however, is challenging as it requires to examine systemically the entire value chain and overcome a range of economic, institutional, cultural, and social barriers. Business model innovation¹ is increasingly seen as essential for advancing sustainable lifestyles (SLs) such as using public transportation, renewable energy, adopting plant-based diets, reducing material consumption, and housing footprint (Bocken and Short, 2016). Such a transition will require a fundamental shift in the purpose of business and how value is defined by companies and society. It will require new innovative actors who can work with other key stakeholders to help solve environmental and social challenges (Mont et al., 2014; Ghisellini et al., 2016; Murray et al., 2017). While business has a key role to play, many large companies are unwilling to promote SLs as this is contrary to their current business models that are focused on growing consumption and sales (Windsor, 2018). Further, logistical hurdles and risks associated with revamping of global supply chains, often prevent companies from adopting new strategies (York and Venkataram, 2010). These factors present an opportunity for entrepreneurial companies with innovative business models who are passionate about sustainability and social impact, and better positioned to take risks. Entrepreneurs' niche experiments can provide valuable insights and social learning about the challenges and opportunities in advancing SLs, as well as help build momentum towards enacting government policies that “change the rules of the game” to reward sustainable businesses (Pacheco et al., 2010; Mont et al., 2014; Windsor, 2018). However, researchers have reported that majority of business model innovations fail and there is a need to better understand the challenges that entrepreneurs face (Geissdoerfer et al., 2018), the impacts they create (Horirsch, 2015) and the role of sustainability networks in entrepreneurial success (Davies and Chambers, 2018). More empirical research is needed to examine the different pathways towards sustainability transformation and how to translate customers aspirations into purchasing activities (Schaltegger et al., 2016).

This paper aims to address some of these research gaps and examine the role of sustainable entrepreneurs in advancing sustainable lifestyles by exploring the following questions: What are some emerging business models for advancing SLs and the role of value chain partners and social networks in ensuring success? What are the social and environmental impacts created by sustainable entrepreneurs and how do they measure and communicate these? What are the main challenges faced by sustainable entrepreneurs presently and how do they work to overcome these? What is the role of sustainable entrepreneurs in advancing sustainability transition?

The paper is structured as follows: it begins with a literature review, illustrating the impact of personal consumption on climate change, current strategies to promote low carbon lifestyles and the role of sustainable entrepreneurs in such a transition. It then introduces the research method utilized and presents key findings from the cross-case analysis. The author then proposes a new framework for the role of sustainable entrepreneurs in advancing SLs and concludes with discussion of the main lessons learned, research contribution, and implications for future policy, practice and research.

2. Literature review

2.1. Sustainable lifestyles — key for addressing climate change and social inequity

Despite the 2015 Paris Agreement to address climate change, signed by 197 countries, global carbon emissions have continued to rise reaching a record of 36.8 billion tons in 2019 (Mooney and Dennis, 2019). Nineteen of the 20 warmest years globally have been registered since 2001, demonstrating a clear trend towards warming (NASA, 2020). Governments around the world have enacted a range of policies to address major sources of emissions: electricity, housing, and transportation. Yet, such efforts will be insufficient to stop global climate change unless we address personal consumption and lifestyles (Mont et al., 2014; Alfredsson et al., 2018; Brown and Cohen, 2019; Southerton and Welch, 2019).

According to the U.S. Environmental Protection Agency (EPA) 42% of U.S. Greenhouse Gas (GHG) emissions are associated with the energy used to produce, process, transport, and dispose of products (99% of which are thrown away in 6 months) (U.S. EPA, 2016). A recent analysis of 79 major cities worldwide revealed a 60% increase of those cities’ carbon footprints when using consumption as opposed to production-based accounting (C40, 2020). While much of the world still needs further development and consumption to reduce poverty and hunger, developed countries must reduce their consumption to address climate change and social inequity. Wealthier countries such as Finland and Japan, for example, have three to five times higher lifestyle carbon footprints compared to poorer countries like Brazil and India (Lettenmeier et al., 2018). In the European Union, total material consumption is estimated at 40–50 tons per capita per year, compared to a sustainable level of 8 tons per capita per year (Mont et al., 2014).

The need to address individual consumption and unsustainable lifestyles was first recognized in 1992 in Agenda 21 but has received limited attention by policy makers and other stakeholders until recently (Mont et al., 2014). Sustainable lifestyles (SLs) are seen as an alternative to the current consumption-centered lifestyles and defined as “a cluster of habits and patterns of behavior embedded in a society and facilitated by institutions, norms and infrastructures that frame individual choice, in order to minimize the use of natural resources and generation of wastes, while supporting fairness and prosperity for all” (UNEP, 2016). A recent UNEP framework for sustainable living defined five core areas for taking actions at the consumer level: housing, mobility, food, consumer goods, and leisure (UNEP, 2016). A shift toward more SLs has the potential to drive greater economic equality, open new business opportunities, and improve quality of life. For instance, telework helps improve employees' wellbeing and engagement; plant-based diets improve health outcomes; preventing waste (from surplus food or consumer goods) is associated with financial and time savings; smaller houses are more affordable.

2.2. Current strategies and challenges in advancing sustainable lifestyles

Three main types of strategies have been used to address personal consumption and advance SLs: (a) education and awareness about the impacts of individual actions on climate change; (b) policies to reduce consumption and change consumer behavior, and (c) innovative business models to reduce or modify consumption.

¹Business model innovation is defined as “the art of enhancing advantage and value creation by making changes both to an organization’s value proposition to customers and its underlying operating model” (BCG, 2020).
2.2.1. Education

While environmental awareness and concerns about climate change are growing (Dennis et al., 2019), few people understand their personal contribution or what actions they can take. A recent study found that 45% of Americans are willing to change their behavior to reduce environmental impacts (Nielsen 2018) but 85% of people do not know their carbon footprint or how to lower it (Grinstein et al., 2018). In a recent study Cordero et al. (2020) measured the impact of a year-long university course about climate change and found that participants reduced their individual carbon footprint by 2.86 tons of CO2 per year five years later. The authors argue that if applied at scale such education programs „would be of similar magnitude to other large-scale mitigation strategies, such as rooftop solar or electric vehicles.”

Other studies have found that education is necessary but not sufficient to change consumer behavior due to the gap between individuals’ aspirations and actions. Even in countries with strong culture for environmentalism, a small share of consumers buy sustainable products (Vringer et al., 2017). Often it is believed that consumers are „free” to make a choice, but research has identified a range of barriers, from simple (e.g., price, availability and quality) to more complex (social, institutional, and economic). For instance, public transportation may not always be available, or it could be inconvenient. While biking has been promoted as healthier alternative to driving, ensuring bike safety remains a challenge in many communities. Telework can help reduce individuals’ carbon footprint and is linked to increased well-being and productivity (Gimenez-Nadal et al., 2018) but it requires adoption at an organizational level. Consumers also face a range of social and moral dilemmas; Vringer et al. (2017) found that people are often reluctant to impose constraints on others. Addressing such economic, institutional, and moral barriers requires government interventions such as new taxes, subsidies, disclosure mandates, or bans.

2.2.2. Government policies

Most research on SLS to date has focused on policy initiatives. Southerton and Welch (2019) analyze different policy approaches for changing individual behavior — from pricing, to information (education), use of social marketing campaigns, and infrastructure development (e.g., for mobility). They argue that while there are many successful examples of effective policies, more must be done to address the social, cultural, economic, and material barriers for reducing consumption. They call for „radical policy experimentation” and an „open debate and dialogue at local, regional, national and international levels that directly tackle consumption and visions of future ways of life.” Such radical approaches include promoting „time affluence” (as alternative to material affluence) and reducing the working week. Such an approach, however, is problematic for many working-class employees, who need overtime hours to meet their basic needs (Laatsch and Scully, 2007).

The literature on sustainability clusters has identified the importance of supporting infrastructure and other local factors in promoting productivity, innovation, and competitiveness (Maskell and Malmberg, 1995; Martin and Mayer, 2008; Porter and Kramer, 2011). Resilient clusters include not only the local businesses but also institutions such as schools, universities, trade associations, and non-profit organizations. Local governments can play an important role in promoting cluster development and firm competitiveness by setting clear and measurable social goals and enacting relevant policies to promote social development and business sustainability (Deutz and Gibbs, 2008; Veleva et al., 2015). In their „shared value” framework Porter and Kramer (2011) emphasize the „profound effect” of a business location on a firm productivity and innovation, which remain understudied by researchers. They argue that „shared value helps uncover new needs to meet, new products to offer, new customers to serve and new ways to configure the value chain, where the resulting competitive advantage will often be more sustainable than conventional cost and quality improvements”.

Other researchers have examined shifting to sustainable consumption through the lens of the social change theory (Cohen et al., 2017). Sustainable consumption is defined as „the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations” (Norwegian Ministry of Environment, 1994). In the current capitalist economy where consumption is seen as key to economic success, changing the dominant „regime” is challenging and more likely to happen gradually through incremental changes „in the fractures of the dominant system, in niches where they do not seem to pose any immediate threat to dominant classes and institutions” (Cohen et al., 2017). More generally, the literature on sustainability transitions, degrowth, and steady state economy, has called for national-level policies to overhaul our current economic system to ensure more sustainable production and consumption (Jackson, 2009; Cosme et al., 2017; Cohen et al., 2017). This approach, however, is outside the scope of the current study.

2.2.3. New business models

A business model is about how an organization creates, delivers, and captures value (or in simple words, how it makes money). In this paper, we define “business model” using three main elements: the value proposition, value creation and value capture. Sustainable business models are distinct in their focus on analyzing and communicating a sustainable value proposition to customers, in how they create and deliver value, and how they capture value while also maintaining or regenerating natural, social and economic capital (Schaltegger et al., 2016). Business model innovation, on the other hand, is more challenging to define. It typically does not require inventing new products, technologies, or markets, but instead involves changing the revenue stream, synchronizing the time horizons, or integrating the incentives (Girotra and Netessine, 2014). For instance, leasing instead of selling solar panels was a major business model innovation which enabled overcoming the upfront costs for customers and thus led to expansion of the market for solar energy. Developing long-term relationships with suppliers, customers and other partners along the value chain, can help companies co-create value, and thus generate competitive advantage. Recent empirical study of 15 Centers for Urban Remanufacture in Europe found that majority of examined initiatives were dependent on external support, and were not financially viable (Ordonez et al., 2019). The researchers concluded that entrepreneurial innovation was needed to make the business case, and recommended launching business incubators in the area of reuse and remanufacturing.

Companies are increasingly seen as playing an important role in changing consumer behavior „through marketing and branding, new business models and choice editing” (Bocken, 2017). Bocken et al. (2014) introduced eight sustainable business model archetypes, described as businesses that (a) maximize material and energy efficiency, (b) create value from waste, (c) substitute with renewables and natural processes, (d) deliver functionality rather than ownership (e) adopt a stewardship role, (f) encourage sufficiency, (g) re-purpose the business for society/environment, and (h) develop scale-up solutions. Bocken and Short (2016) introduce the concept of „sufficiency-based business models” where companies deliver sustainability by „reducing absolute material throughput and energy consumption associated with provision of goods and services by moderating end-user consumption and
encouraging consumers to make do with less.” Key enablers for companies’ success with such business models include: strong focus on customers, commitment to go against the business-as-usual trends, performance and incentive systems aligned with sustainability objectives of the firm, strong focus on quality and durability, and radically different marketing campaigns. Freudenreich and Schaltegger (2020) examine sufficiency-oriented business models in the clothing industry and report that innovations such as service- and sharing-oriented businesses can be successful and help address both social and environmental problems in the clothing sector. However, legislation and policy intervention are often needed to bring such niche practices to the mainstream (Bocken and Short, 2016). This confirms previous findings by Lumpkin and Katz (2011) that besides B Corporation and social entrepreneurs, most profit-oriented corporations “cannot be expected to solve climate change and other environmental problems without changes in government incentives for business.” Geissdoerfer et al. (2018) further report the design-implementation gap in sustainable business model innovation which leads to market failure.

2.3. The role of sustainability entrepreneurs in advancing SLs

There is a growing body of research on the role of entrepreneurs in addressing sustainability challenges. Thompson et al. (2011) provide one of the most comprehensive analysis of the similarities and differences between social, environmental and sustainable entrepreneurs. While all three are similar in their mission-driven undertakings, they also differ. Social entrepreneurs are primarily focused on their social mission related to helping people. Environmental entrepreneurs focus “on environmentally-relevant market failures” and seek to deliver both economic and ecological benefits. Sustainable entrepreneurs aim to deliver long-term benefits across a “triple bottom line” or create simultaneously environmental, social and economic benefits (Thompson et al., 2011). For the purposes of this study we will focus on sustainable entrepreneurs with the recognition that there is an overlap between the three types and environmental entrepreneurs are a sub-category of sustainability entrepreneurs (Thompson et al., 2011).

According to York and Venkataraman (2010) entrepreneurs are best positioned to solve complex problems and turn uncertainty into business opportunity with social and environmental benefits as they are willing to take risks and innovate. Bocken and Short (2016) demonstrate that while startups may not be economically viable initially, this can change over time because of regulatory action or changes in the market. Even though entrepreneurs have limited resources and reach, their ability to foster strategic partnerships with large players can stimulate disruptive innovation, leading to industry transformations in sustainable development.2 Pacheco et al. (2010) demonstrate how sustainable entrepreneurs are able to change the “rules of the game” or the competitive landscape, by proactively devaluing and influencing the establishment of new industry norms, property rights, and government legislation that transform the payoffs of their competitive games. Examples of such industry transformations include the Fair-Trade movement, Leadership in Environment and Energy Design (LEED) for buildings, and benefits corporation (B-Corp) certification. According to Pacheco et al. (2010) entrepreneurs are able to “escape the green prison” or the disadvantages they face when pursuing costly sustainable actions, by either identifying opportunities within the current market system or “creating new opportunities through institutional changes that improve the competitiveness of sustainable behavior.” Schaltegger et al. (2016) take a co-evolutionary view of sustainability transformation by examining how pioneering business models can be scaled or replicated by startups and large companies (incumbents), leading to sustainable mass markets. Haigh and Hoffman (2014) report how hybrid organizations, defined as organizations at the interface between for-profit and nonprofit sectors that address social and ecological issues, are able to successfully challenge “the notion of trade-offs between economic, ecological, and social systems and instead create business models that develop synergies between them.” The result is creating opportunities for “for-profit activities to be undertaken in ways that address sustainability issues.” The authors demonstrate how hybrids challenge (a) the existing beliefs about the social, ecological and economic system, (b) the competitive practices, and (c) how sustainability is enacted.

2.3.1. Sustainable entrepreneurs’ key challenges

Firms focused on new business models for sustainability, however, face many challenges. Geissdoerfer et al. (2018) report that numerous new business model innovations fail due to the inability to implement their ideas in practice. Based on comprehensive literature review they identify six categories of challenges: (a) balancing a triple bottom line, (b) mind-set challenges, (c) lack of resources, (d) difficulty integrating technology with business model innovation, (e) engaging in external relations, and (f) lack of effective sustainability-focused business modelling methods and tools. The authors call for additional research on the challenges that business model innovation faces and the reasons for the low success rates. Future studies should help understand: (a) the implementation of the business model innovation process, (b) its tools, and (c) its challenges (Geissdoerfer et al., 2018).

Veleva and Bodkin (2018) report that top challenges for both entrepreneurs and large companies focused on waste reduction and circular business models include the lack of regulation and incentives, the lack of data and indicators to measure and communicate impacts, and the cost of product or waste take-back. Entrepreneurs face additional challenges such as lack of brand awareness and market demand, access to financing, mentorship, networks, and the complex product or packaging design that prevents proper repair or recycling. The economic viability of secondary supply chains (focused on product reuse or remanufacturing) can be a key challenge due to the cost of recovering products and materials (Freudenreich and Schaltegger, 2020). Entrepreneurs also face the challenge of effectively communicating their sustainability impacts (Horisch, 2018; Holt and Littlewood, 2015). More broadly, entrepreneurs focused on creating new opportunities may be limited by the opposition of other interested parties with powerful political influence who may impair entrepreneurs’ ability to promote new institutions” (Pacheco et al., 2010). Overcoming these challenges often requires that entrepreneurs look beyond their industry peers to form relationships with environmental, economic development or other civil organizations (Pacheco et al., 2010). Policy makers, are key for supporting the growth of start-ups by providing subsidized loans and other legal infrastructure to internalize existing externalities (Horisch, 2018).

2.3.2. Sustainable entrepreneurs’ impacts

Being able to achieve positive environmental and social impacts is at the core of the business model for sustainability for entrepreneurs and how they differentiate from competitors. At the same time, Holt and Littlewood (2015) find that most entrepreneurs are not effectively measuring and capturing such impacts. To address this challenge, they offer a framework for identifying, mapping and

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2 “Disruption” usually describes a process where a smaller company with limited resources is able to “successfully challenge established incumbent businesses” (Christensen et al., 2015).
building indicators of impact for hybrid organizations. The authors further acknowledge that both positive and negative impacts may arise from entrepreneurs’ activities and these must be clearly identified and addressed. Often there are trade-offs between the environmental and social impacts. Measuring and reporting impacts is challenging due to its complexity and lack of resources, even though it is critically important for “fostering stronger relationships between hybrids and external stakeholders including customers, beneficiaries and communities, international donors and supporters, and managers in traditional businesses” (Holt and Littlewood, 2015; p. 122). Horisch (2018) also reports that “sustainable start-ups face the challenge to communicate the sustainability effect connected to their products and services.” Without communicating both the direct and indirect impacts, they are unable to put pressure on established competitors or standard-setting organizations in order to change consumer expectations and prevailing norms (Horisch, 2018).

More broadly, however, the assessment of social and environmental impacts is challenging because it is based on personal values, beliefs and priorities. In his analysis of the socio-technical transitions to sustainability, Geels (2010) raises the question of who should choose between multiple “green” pathways and establish the criteria for the choice? One option is the government to do so with the assistance of technical experts; the second one includes a more inclusive group of stakeholders, society groups and the public. In both cases it is important for entrepreneurs to be part of this process to gain legitimacy and public support, since these are key for securing financial investments and supportive policies (Geels 2010). Similarly, Costa & Pesci (2016) find that effective metrics must be defined and constructed in an open dialogue with all relevant stakeholders; that there is no single “gold standard” of measurement but instead a variety of metrics which reflect local goals, needs and stakeholder demands.

2.3.3. Sustainable entrepreneurs as network facilitators

Using social network theory, Neumeyer et al. (2018) demonstrate that entrepreneurs’ degree of connectivity with key stakeholders and access to different types of networks is key for their success. Oskam et al. (2018) introduce the concept of “value shaping” which refers to the “mutually constitutive process in which on the one hand networking helps to refine and improve the overall business model and on the other hand an improved business model spurs expansion of the network.” The authors identify five micro-level processes through which value shaping happens: ideation, conception, business start-up, early growth and continued growth. They report that redirecting value and extending value are influenced by network interaction and are a critically important step in creating value for multiple stakeholders.

Other researchers have also demonstrated that „transformation to sustainable practices is an incremental and co-evolutionary process requiring collective action among actors, including but not limited to sustainable entrepreneurs” (DiVito and Bohnsack 2017; Schaltegger et al., 2016). Horisch (2015) uses the multi-level perspective (MLP) as theoretical framework to examine the role of entrepreneurs in sustainability transitions. According to the framework developed originally by Geel (2002), societal transitions “result from interaction processes between three different socio-economic levels, which build a nested hierarchy: micro level niches, meso-level regimes and macro-level landscape” (Horisch, 2018). Start-ups are important actors primarily at the niche level, although they can play a role at the meso-level. Their role, however, is currently underexplored. Based on literature review Horisch (2018) identified two ways in which entrepreneurs can advance sustainability transitions: through their market impact and through their sustainability effect. Sustainability entrepreneurs must first create products and services with positive societal impacts and then distribute these “as widely as possible to develop a large overall sustainability effect and a significant contribution to sustainability transitions.” This, however is challenging as start-ups either have limited resources to expand or are restricting their growth to stay true to their mission. Regardless, start-ups can influence other important actors at the meso-level, such as large companies (Schaltegger et al., 2016), public authorities and standardizing bodies (e.g., the International Organization for Standardization) which are critically important for changing regimes and advancing a societal transition.

Our understanding of the sustainable entrepreneurial ecosystems and how it leads to change, however, is still limited, according to Neumeyer et al. (2018), who call for further research into four areas: (a) how environmental, social and economic value is created in a community or a region, and the role of key stakeholders; (b) what are the formal and informal rules for being part of a sustainable entrepreneurial ecosystem; (c) how can success be defined and measured, and (d) what is the role of emerging online social networks in advancing sustainable business models. Schaltegger et al. (2016) call for more empirical research on the different pathways taken by sustainable niche pioneers and other market actors, and the challenges and opportunities they face. Ludeke-Freund (2020) integrates two major perspectives about the role of entrepreneurs – agency perspective and systems perspective – and calls for more empirical research to examine “if and how sustainable entrepreneurs can unfold agency within given systems such as industries and markets” and “if and how sustainable entrepreneurs actually use their business models to benefit from public policies.”

This study aims to address some of these research gaps, by examining sustainable entrepreneurs’ business models, created impacts, current challenges and how they work with key stakeholders to overcome these and advance a shift to more SLs.

3. Study design and method

This study is based on interviews with eight U.S.-based entrepreneurial companies focused on reducing material consumption and promoting SLs. The sustainable entrepreneurs in the study included Box Save, Fixit Clinic Newton, Food For Free, IRN Surplus, Joro, Preserve, Project Repat, and Semi-New Computers. They represent both for-profit and non-profit organizations from diverse sectors in different stages of development. Data for each company was collected between December 2018 and May 2019 using two main sources: (a) publicly available information from websites, case studies, and other publications, and (b) in-depth, semi-structured interviews with founders and senior managers. The interview protocol was developed based on a literature review. All interviews were audio-recorded and transcribed for accuracy. The empirical data was managed through cross-case analyses using methodology described in Eisenhardt (1989) and Eisenhardt and Graebner (2007). All collected data and information were aggregated and summarized in a table format to enable further analysis (see Appendices A and B). To ensure validity and reliability of the qualitative analysis, as well as protect confidential information, each participating company was invited to review and provide feedback to the transcribed interviews and data analysis. The primary goal of the study design was to select a diverse group of companies in terms of maturity (measured by years in operation), type of business (for-profit or non-profit), and business model (selling products or services). All participating entrepreneurs were committed to delivering benefits across a “triple bottom line.” The study focused primarily on Business to Consumer (B2C) companies to gain insights about how participating entrepreneurs work to change consumer behavior and the key challenges they face in this
process. The interview questions and case research explored the following:

- What are some emerging business models for advancing SLs and the role of value chain partners and social networks in ensuring success?
- What are the social and environmental impacts created by sustainable entrepreneurs and how do they measure and communicate these?
- What are the main challenges faced by the entrepreneurs and how do they work to overcome these? What is their role in the transition to SLs?

4. Research findings

Detailed descriptions of the cases are provided in Appendix A and include each company story and current activities. Appendix B summarizes the key findings for each participating company in four areas: (a) business model and value proposition, (b) social and environmental impacts, (c) key challenges, and (d) future opportunities for scaling up sustainable business models.

4.1. Sustainable business models’ success factors

Study participants reported a range of factors behind their business success such as increasing awareness about climate change and other environmental and social problems, strategic partnerships along the supply chain, sustainability policies, IT, and quality customer service, confirming previous findings (Dean and McMullen, 2007; Bocken and Short, 2016; Veleva and Bodkin, 2018). Growing consumer awareness and willingness to take action were reported as important enablers by Food For Free, Joro, Preserve, Semi-New Computers, and IRN Surplus, confirming findings by Cordero et al. (2020). “People are paying more attention to sustainability. I see the momentum, especially in the last few years. Some of it is related to culture, some to regulation,” according to Sasha Purpura, executive director of Food For Free (Veleva and Smith, 2020). Sustainability-focused public policies directly or indirectly support their business models. For instance, the Massachusetts Organics Ban in 2014 and the higher waste disposal fees have benefitted Food For Free, Preserve and IRN Surplus. The City of Newton’s policies to reduce waste and increase reuse are key for the launch of Fixit Clinic Newton.

Analysis of the eight cases revealed that strategic long-term partnerships along the value chain are a key part of each entrepreneur’s business model (see Table 1). For instance, Semi-New Computers’ partnership with Harvard University and large corporations provides continuous source of surplus computers for refurbishing and resale/donation. Joro’s partnership with a carbon offset organization provides opportunities for revenue generation. For recycling company Preserve, partnerships with materials processors ensure a continuous supply of raw material (post-consumer polypropylene), where its partnerships with retailers such as Whole Foods and Target ensure a sales channel. Food for Free’s partnerships with grocery stores and universities ensure access to fresh, healthy food, while its partnership with cities provides funding and access to people in need. Furthermore, all participating entrepreneurs are part of an informal ecosystem of sustainable businesses and other stakeholders who act as suppliers, customers, or strategic partners (e.g., Food For Free and the Town of Cambridge, Box Save and Monoflo, Fixit Clinic and Green Newton, Preserve and Stonyfield Farm, Plum Organics and Ocean Plastics initiative). Such networks, while informal and underdeveloped, provide competitive advantage and ensure entrepreneurs stay true to their sustainability mission. This finding is in line with Neumeyer and Santos’ (2018) research about the importance of social capital and access to different types of network actors for launching a sustainable business model. The geographic location (Massachusetts, USA) was also reported as key factor for entrepreneurial success, confirming previous research on the importance of a specific location for providing supportive culture, capital and other resources, as well as allowing to quickly respond to customer needs and gain trust and legitimacy (Neumeyer et al., 2018; Porter and Kramer, 2011).

In all cases technology enables companies to optimize logistics, reduce the costs of storing and shipping (e.g., Box Save, IRN Surplus), leverage low cost marketing (e.g., Preserve, Joro, Box Save, and Project Repat) and educate customers (Joro, Food For Free). With exception of Semi-New Computers, all entrepreneurs use online social networks such as Facebook, Twitter, Instagram, LinkedIn, YouTube, and others (see Table 1), which they see as critical for their business success. This finding confirms previous research by Correia et al. (2014) on the role of social networks and mobile technologies in building competitive advantage by providing a new way to expand business, adapt to new consumers, turn fans into customers, and develop tacit organizational knowledge about virtual communities with which is hard to replicate (Correia et al., 2014). The research also confirmed previous findings about the importance of having a strong focus on customers, building long-term relationships, providing some incentives, and making it easy for consumers to act (Bocken and Short, 2016; Bocken 2017).

4.2. Measuring and communicating social and environmental impacts

Each company in the study created both social and environmental impacts (see Appendix B), confirming previous research by York and Venkataram (2010) and Haigh and Hoffman (2014) that entrepreneurs (and sustainability entrepreneurs in particular) are best positioned to solve complex problems and deliver social and environmental benefits. In addition to addressing waste and GHG emissions, participating entrepreneurs create positive social impacts such as developing new skills (Fixit Clinic, Semi-New Computers), reducing food insecurity (Food For Free), saving time (Box Save, IRN Surplus), and improving health (Joro, Food For Free), in addition to creating local jobs. Moreover, several participating entrepreneurs reported their social impacts as key for differentiating from competitors. While for companies like Joro educating and empowering consumers to address climate change is at the core of their business model, other study participants emphasize cost or time savings, revenue generation, social impacts, and/or outstanding customer service. As one of the interviewees summed it up, “Green attributes do not always lead to sales,” confirming previous findings by Esty and Winston (2009).

All study participants reported lack of resources to more effectively measure the environmental and social impacts of their products and services. While some included specific indicators such as amount of products/waste repurposed or people served, these typically measured outcomes and not overall impacts such as greenhouse gas emissions prevented, skills developed, or time and dollars saved. For instance, IRN Surplus provides its customers with individualized reports which describe the outcomes and some impacts, but the latter are often qualitative or measure outputs, versus impacts. For example, for one of its customers – Kent Place school in Summer, New Jersey – IRN Surplus leveraged its network and partnership with Steelcase to locate a nearby recipient - Habitat for Humanity ReStore in Bucks County, PA, about 70 miles away. The company reported several key impacts from the project: (a) the school’s ability to uphold its commitment to sustainability
Table 1

| Company                  | Suppliers                                | Large companies | Other entrepreneurs | Policy-makers | NGOs and others | Online social networks |
|--------------------------|------------------------------------------|-----------------|---------------------|---------------|-----------------|------------------------|
| Box Save                 | Monello - manufacturer of PP boxes       | Moving companies, real estate (apartment complexes) | Part of online network of similar businesses across U.S.; other sustain entrepreneurs (e.g., Rentfro's) | Not presently but interested; a carbon tax would support their business model | Customers include small businesses and universities | Marketing on Fb, Yelp, Google; part of network of 40 similar businesses across U.S. |
| Fixit Clinic             | Individuals                              | —               | Entrepreneurs may participate in events to help repair products | City of Newton/Newtown Recycling committee, DPW grant, Right to Repair Law Greater Boston Food Bank, DEP and EPA; several local cities (Cambridge, Boston) provide grants; tax break for donors; space and transportation support | Green Newton, Newton Public Library, volunteers Universities & schools provide surplus food, distribute healthy meals; volunteers prepare food; homeless shelters | Facebook, Nextdoor.com |
| Food for Free            | Large companies, grocery stores, universities, Amazon Fresh | Donating food; providing grants, space (e.g., Biogen) | Other non-profits, farms | Not involved but would like to see initiatives such as higher tax on waste 2018 CleanTech Open Northeast Regional Winner (funding, mentorship) Compostable product sales growing after the MA Organics Ban in 2014 | NGOs & others working on wind & forestry projects Ocean Plastic Initiative partners | Facebook, Twitter, Instagram and LinkedIn; Facebook, Twitter, Instagram, Facebook and Pinterest; newsletter |
| IRN Surplus              | Companies & universities                 | Provide surplus items; Steelcase | Habitat for Humanity | Not involved but would like to see initiatives such as higher tax on waste 2018 CleanTech Open Northeast Regional Winner (funding, mentorship) Compostable product sales growing after the MA Organics Ban in 2014 | NGOs & schools as recipients of surplus items | Facebook, LinkedIn |
| Joro                     | Carbon offset providers                  | Electricity companies’ individual use data | Sustainable businesses’ products recommended | — | — | — |
| Preserve                 | Materials suppliers of recycled PP       | Whole Foods, Target – post-consumer plastic | Plum Organics and Stonyfield Farm | — | — | — |
| Project Repair           | Individual consumers sending old T-shirts | Recycling providers for generated waste; shipping companies | Low carbon packaging provider; Precision Sportswear (MA) and Opportunity Threads (NC) Entrepreneurs in Nigeria, Ghana and Sierra Leone; Fixit Clinic Cambridge | — | — | — |
| Semi-new computers       | Harvard University, large companies      | Harvard University; large companies with surplus computers | — | — | — | — |

and reuse or recycle more than 5.5 tons of furniture without paying more than for disposal; (b) Steelcase's ability to uphold its commitment “to providing environmentally sustainable products and services throughout the lifecycle of Steelcase products,” and (c) dozens of families who benefitted from obtaining “high-quality, low-cost furnishings through the Habitat ReStore, or living in the Habitat homes that ReStore revenues help to build.” (IRN Surplus, 2020). Food For Free measures the amount of surplus food repurposed (in pounds) and the number of meals distributed. In 2019 it helped rescue 2 million pounds of food and feed over 30,000 people (Veleva and Smith, 2020). The company, however, is unable to estimate the GHG gas emissions prevented from food rescue compared to composting or disposal, or the dollar savings and improved health outcomes for people having access to fresh, healthy food. Similarly, Fixit Clinic Newton measures the number of participants and products repaired but is unable to track and report the environmental and social impacts such as increased awareness of environmental problems, reduced GHG emissions and waste, new skills development, time to repair a product, or dollars saved. For many people the lack of time often leads to buying new products instead of repairing the old ones, a sustainability challenge reported previously in the literature (Southerton and Welch, 2019).

Better measurement would not only help strengthen entrepreneurs' value proposition among early adopters as reported by Veleva and Bodkin (2018) but is also crucial for evaluating potential trade-offs and demonstrating an overall positive impact. For instance, Box Save estimates that when comparing cardboard boxes to reusable crates for 400 users, manufacturing of the former generates 27,000% more CO2 (not including shipping for landfill or recycling) (Donovan, 2020). This estimate, however, does not reflect the fact that cardboard is made of renewable resource, while polypropylene is derived from fossil fuel. Preserve's move to compostable single use products could help reduce the GHG emissions from collecting and recycling post-consumer polypropylene. However, recent studies have warned about potential presence of highly toxic per- and polyfluoroalkyl substances (PFAS) in compostable products, a class of over 3,000 fluorinated chemicals that persist in the environment for a long time, and are associated with cancer, developmental toxicity, immunotoxicity, and other health effects (CPA, 2018). Furthermore, compostable containers require special facilities for handling (e.g., anaerobic digesters), which may not be available locally, potentially leading to landfill disposal or incineration, both associated with release of GHG emissions (Veleva and Smith, 2020). While Semi-New Computers is committed to prevent waste and GHG emissions while closing the digital divide by sending refurbished computers to Nigeria, Ghana and Sierra Leone, they have been criticized for potentially contributing to the growing e-waste crisis in Africa (Clark and Clark, 2019). In addition, shipping computers to such far destinations contributes to climate change and air pollution. Without proper life-cycle analysis and measurement of the overall social and environmental impacts of their business, it is not possible to confirm the overall positive impact.

These findings illustrate the importance of developing and using effective indicators to measure and evaluate the social and environmental impacts at a company or product/service levels. Previous research has found that even large companies within the same sector using standardized indicators, report inconsistent and vastly different measures focused on outputs rather than impacts (Veleva et al., 2017). Aggregating different measures to identify an overall impact is challenging as it reflects a variety of assumptions, local
issues, and personal values, therefore must include other stakeholders affected by such practices. This confirms research by Costa and Pesci (2016) that effective metrics must be defined and constructed in an open dialogue with all relevant stakeholders; that there is “no single “gold standard” of measurement but instead a variety of metrics which reflect local goals, needs and stakeholder demands (Costa and Pesci, 2016; Matzembacher et al., 2019). Deven’s eco-industrial park provides one example of how a multi-stakeholder process can be leveraged to develop locally-relevant sustainability indicators, which can serve as a valuable tool to raise awareness, promote transparency and accountability and guide local policies towards established goals and targets (Veleva et al., 2015).

4.3. Current challenges and future opportunities for advancing SLs

Despite their success to date, study participants reported numerous challenges in scaling up operations (see Appendices A and B). While all of them offer competitive pricing, they often cannot compete with inexpensive imports from China based on cost alone (e.g., Preserve, Semi-New Computers, Project Repair). To stay true to their mission, many face costly sustainable actions, such as using sustainable packaging, eco-friendly materials, or recycling waste instead of sending to landfill (e.g., Project Repair, Food For Free, Box Save, Preserve, Semi-New Computers). This confirms previous findings that entrepreneurs are often at competitive disadvantage when pursuing new sustainable business models (Pacheco et al., 2010; Ludeke-Freund, 2020).

All entrepreneurs report insufficient funding and other resources (space, transportation, storage, volunteers) as a key challenge. Non-profit organizations such as Food For Free and Fixit Clinic rely on grants and volunteers to support their work; others such as Box Save, Semi-New Computers, Project Repair, Joro, and Preserve, capture value based on customers’ willingness to pay for a product or service that is high quality, good value or socially and environmentally responsible. All entrepreneurs in the study reported not having the capacity to effectively measure and communicate the social and environmental impacts of their products and services which could strengthen their value proposition. These findings confirm previous research on the barriers faced by companies advancing new business models to reduce consumption (Pacheco et al., 2010; Bocken and Short, 2016; Veleva and Bodkin, 2018).

The lack of brand awareness was another challenge faced by most entrepreneurs, especially the “younger ventures” such as Box Save, Joro, Project Repair and Fixit Clinic. Some reported lack of consumer awareness about how to act to address sustainability challenges (Joro, Fixit Clinic, Box Save), while others reported a gap between consumer aspirations and actions (Preserve, Semi-New Computers). This confirms previous findings that consumer education is necessary (Grinstein et al., 2018) but not enough to change behavior (Vringer et al., 2017). Social media could be leveraged further to help consumers overcome some of the social and moral dilemmas reported in the literature (Vringer et al., 2017). Study participants also reported the need to raise awareness about the environmental and social impacts of reuse versus recycling and disposal in order to change the evaluation criteria used by customers, confirming previous research by Veleva and Bodkin (2019). Customers’ lack of time was reported as a barrier by some participants (e.g., Fixit Clinic Newton, Preserve, Joro) but was leveraged as opportunity by others (e.g., Box Save, Food For Free, IRN Surplus).

The heightened attention to landfill issues, for example, by young people and alternative sustainability action and increasing local sourcing and zero waste commitments by cities and companies are expected to support future sustainable entrepreneurs. In addition, as reported by Windsor (2018) “businesses, consumers and institutions (government and others) “are likely to face increasingly volatile, uncertain, complex, and ambiguous conditions in the future”. The 2020 Covid-19 pandemic, for instance, is expected to accelerate the shift towards more local and regional production and consumption, leading to reduced GHG emissions from transportation and new opportunities for sustainable entrepreneurs (McKinsey, 2020).

All sustainable entrepreneurs in the study see the lack of government policies such as carbon tax, bans on disposal of certain products, mandating design for repair, or a full-cost accounting, as the greatest barrier for scaling up their businesses but also the greatest opportunity in the future which confirms previous research (Caldera et al., 2019; Veleva and Bodkin, 2019). For instance, a carbon tax (or a tax on raw materials) would make Preserve products and Box Save services more price competitive. Bans on landfill disposal of furniture and other products, would help create markets for reuse and recycling and support entrepreneurs such as IRN Surplus. The 2014 Massachusetts Organic Waste Ban for example, has led to significant growth in entrepreneurial companies focused on food rescue and composting, and measurable economic and social benefits (ICF, 2016). Adopting laws mandating design for disassembly and repair, could help expand the secondary markets for many products and support entrepreneurs such as Semi-New Computers and Fixit Clinic. Introducing reporting requirements for waste similar to the City of Boston Building Energy and Disclosure Ordinance (City of Boston, 2017) can increase transparency about the amount of waste generated and create incentives for large organizations to seek alternatives to landfill or incineration.

5. Discussion

Although entrepreneurial players in the study have been able to identify opportunities within the current consumption-based economic system, scaling up such niche experiments requires involvement of other stakeholders and policy action (Dean and McMullen, 2007; Bocken and Short, 2016; Southerton and Welch, 2019; Cohen et al., 2017; Horirsch, 2015; Ludeke-Freund, 2020). For instance, the proliferation of Fixit Clinics in the U.S. has attracted the support of politically-active public advocacy groups which are working with citizens and progressive policy makers to adopt new “Right to Repair” mandates at state levels (Proctor, 2019). As of December 2019, at least 20 U.S. states had put forward Digital Right to Repair Bills; these however, were opposed by the $2.5 billion electronic industry, demonstrating the push back by powerful incumbents and the challenges in changing current regimes (Allendorf, 2018). Transitioning to more sustainable consumption systems requires creation and reinforcement of a new path, as well as “destabilization of the existing path,” according to Heiskanen et al. (2011). Path dependence is defined as the self-sustaining characteristics of existing systems, while path creation relates to creating new paths by engaging various stakeholders and generating momentum and respectively, change (Heiskanen et al., 2011). Environmental entrepreneurs are often seen as “agents of change” and “a major force in the overall transition towards a more sustainable business paradigm” (Schaper 2002). While they are more likely to pursue path creation in sustainable consumption systems, the latter requires significant resources, including financial and political power, which they often lack, as demonstrated in the current study. What entrepreneurs are able to do, however, is to educate and influence other stakeholders, advance informal and formal sustainability networks and thus create momentum towards new policies, norms, and institutions. For instance, Food For Free is able to influence both policy makers and large companies to secure resources, reduce food waste and advance new policies to
change food expiration labels. Preserve’s business model has attracted the attention of some large companies such as Berry and VDL: “There’s something about what Preserve has been doing that makes the larger companies interested in us. One example is with Berry, a company with $4 billion in sales and $9 billion in market cap. They work with the Gimme 5 program every year and they make that Preserve To Go container. Our partner in Europe is VDL [They make the Mini Cooper]. They are an ecofriendly/socially responsible business and they are huge.”

Transition to more sustainable lifestyles requires collective action and collaborations among various stakeholders, including users, NGOs, progressive large companies and policy makers. A truly sustainable future “requires system-based thinking that involves in equal measure, society, environment and economics” (Murray et al., 2017) and calls for new policies that reward sustainable behavior. Based on the study findings and analysis, the author proposes a new framework for the role of sustainable entrepreneurs in advancing sustainable lifestyles (see Fig. 1), which demonstrates that they are not only innovators but also civic actors supporting this transition. In collaboration with a range of stakeholders such as other sustainable entrepreneurs, large companies, NGOs and policy makers, sustainable entrepreneurs launch innovative business models to advance SLs. Most of their business model innovations include social rather than technical experiments which provide valuable insights and social learning about the challenges and opportunities in changing consumer behavior. To succeed, sustainable entrepreneurs leverage strategic partnerships, social media, IT, the growing sustainability awareness, and public policies, which help them identify opportunities within the current economic system. Their main value proposition for consumers is based on offering cost or time savings, social benefits, education and empowerment to act; they also provide strong customer focus and quality service. With their business model experiments, sustainable entrepreneurs help create informal and formal sustainability network and influence key stakeholders such as large companies, NGOs and policy makers. Thus, they act not just as innovators but also as civic actors helping create momentum towards enacting government policies that “change the rules of the game” to reward sustainable businesses that help address climate change and social inequity.

The current study confirmed many findings from prior research about sustainable entrepreneurs’ ability to launch innovative business models to address complex issues such as climate change and social inequity. It also identified some key lessons learned by first movers. First, entrepreneurs are well positioned to address simultaneously environmental and social issues. However, they lack the resources to effectively measure related impacts to strengthen their value proposition and demonstrate an overall positive impact. Such measures require working with other stakeholders and developing locally-relevant indicators reflecting existing challenges, needs and goals. Second, environmental awareness has significantly increased in recent years and a growing number of people are willing to take actions to reduce their carbon footprint. Educating and empowering such early adopters could not only support new innovative business models, but also help change prevailing social norms, if effectively leveraging social networks and strategic partnerships. Third, promoting green attributes alone is not enough to change the behavior of most consumers. It is critically important to emphasize other benefits such as a product/service quality, social impacts, time or cost savings. This confirms previous findings by Esty and Winston (2009) that sale of green goods is difficult and “green” should be promoted as the „third button” after quality and cost savings. Fourth, formal and informal sustainability networks, social media, and sustainability policies, are key to developing viable business models and competitive

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3 Interview with Eric Hudson, March 24, 2019.
strategies that are difficult to replicate. Finally, to avoid “costly” sustainability actions and change the competitive landscape, entrepreneurs need to reach out and collaborate with other key stakeholders such as policy makers, NGOs, and citizens coalitions, in order to change „the rules of the game,” such as the laws, institutions and social norms. Without such actions their market and sustainability impacts will be limited.

The study demonstrates that policymakers have a key role to play in advancing SLs by (a) adopting consumption-based GHG emission inventory and raising awareness about the impact of individual lifestyles on climate change; (b) enacting effective regulations or eliminating regulatory hurdles to SLs; (c) providing incentives to companies engaged in such practices through taxes, subsidies, disclosure mandates, or bans on certain products or practices in order to „level the playing field”; (d) providing financial support, networking and mentorship opportunities for sustainable entrepreneurs, and (e) supporting development of enabling infrastructure, new institutions and norms that promote SLs. Local zero waste goals or waste bans, for example, can increase demand for alternatives to landfill disposal and incineration and thus act as powerful drivers for entrepreneurial innovation. Improved city planning could advance the use of public transportation, bicycling, and walking, supporting entrepreneurship in innovative business solutions such as bike and shooter sharing. Enacting regulations that ban toxic chemicals from products and packaging, and mandating design for disassembly and repair, are crucial for enabling reuse of products and materials. Policy makers can utilize tax incentives or subsidies to reward companies advancing more durable, low-carbon choices such as the Swedish tax break for repaired products (Orange, 2016) and the European Union “right to repair” laws (Right to Repair, 2020). Providing financial support to entrepreneurs and other organizations in the form of grants, low interest loans, or business incubators, is critical for supporting smaller companies as previously reported in the literature (Lowitt, 2008; Rizos et al., 2015; Ludeke-Freund, 2020). In addition, government agencies could partner with non-profit organizations to help raise awareness about the importance of waste prevention and reuse versus recycling, by launching carbon footprint labels, awards, benchmarking studies or networks promoting SLs. Such networks should include a variety of stakeholders, such as entrepreneurs, progressive corporations, non-profit organizations, academics, policy makers, and citizens’ organizations. They could work to develop a locally-relevant vision for sustainable living, indicators to measure progress, and actions to drive change.

6. Conclusion and future prospects

The present study demonstrates that a growing number of sustainability entrepreneurs are experimenting with new business models to promote sustainable lifestyles. They are able to overcome existing challenges by leveraging the growing consumer awareness, value chain partnerships, IT, social networks and sustainability-focused policies, to launch innovative products or services which offer time or cost savings, quality service, and a range of social and environmental benefits. In this process they help educate and influence other important actors such as NGOs, large companies, and policy makers, confirming previous research by Geels (2010) and Ludeke-Freund (2020). Sustainability entrepreneurs, however, are unable to achieve a market effect and a shift to SLs on their own, which requires political support and new regulations. Their role is to experiment with innovative business models, help create sustainability networks, educate and influence key stakeholders, and empower them to act. In this process entrepreneurs provide valuable insights and social learning which has largely been missing in the sustainability transitions literature primarily focused on technological innovations and solutions. Scaling up entrepreneurs’ experiments to achieve a market impact (Horisch, 2018), however, requires the collaboration of various stakeholders in order to advance better measurement, bold policy interventions, enabling infrastructure, and new social norms to promote sustainable living. Policy makers in particular have a key role to play to internalize existing externalities and ensure sustainable entrepreneurs are not at competitive disadvantage, which confirms previous findings by Ludeke-Freund (2020).

The study has several limitations. First, it only included eight entrepreneurial companies. A future study should consider including a larger number of entrepreneurs within each of the five domains of SLs to examine emerging drivers, challenges and future opportunities as seen by the participants. Research can also focus on a specific sector to explore in greater detail emerging business models and how entrepreneurs work with policy makers and other stakeholders to define key sustainability goals, indicators, and strategies to change existing norms and institutions. Another limitation was that participating companies were based in Massachusetts, a state with high public awareness and support for environmental and social initiatives. A future study could consider comparing two different regions to examine the impact of environmental awareness and culture on entrepreneurial success. In addition, future research could include a multi-stakeholder study for a specific region to examine the role of social and cultural norms and institutions on consumer behavior.

The main contribution of this research is that it demonstrates that sustainable entrepreneurs act as civic and political actors who not only offer innovative products and services, but also help educate and influence key stakeholders, develop informal sustainability ecosystem, and thus create momentum for civil and political changes. The study examines the main challenges faced by sustainable entrepreneurs presently and provides key lessons learned about how to overcome these. It illustrates the need for implementing effective indicators to measure the social and environmental impacts of sustainable products/services, in order to evaluate potential trade-offs and ensure overall positive impact. The research confirmed previous findings about the ability of entrepreneurs to identify opportunities within the current market system. However, it demonstrates that sustainable entrepreneurs cannot change “the rules of the game” on their own. Scaling up their business models to achieve market and sustainability impacts requires collaborations among various stakeholders and bold policy actions to change the incentives for consumers and companies.

CRediT authorship contribution statement

Vesela Veleva: Conceptualization, Methodology, Formal analysis, Writing - original draft.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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