Collaborative entrepreneurship for sustainability. Creating solutions in light of the UN sustainable development goals

Stefan Schaltegger*

Centre for Sustainability Management (CSM),
Leuphana University of Lüneburg,
Scharnhorststr, 1, D-21335 Lüneburg, Germany
Email: schaltegger@uni.leuphana.de
*Corresponding author

Markus Beckmann

Corporate Sustainability Management,
Friedrich-Alexander-University Erlangen-Nuremberg,
Findelgasse 7/9, D-90402 Nuremberg, Germany
Email: markus.beckmann@fau.de

Kai Hockerts

Copenhagen Business School,
Dalgas Have 15, 2000 Frederkisberg, Denmark
Email: kho.msc@cbs.dk

Abstract: Sustainable entrepreneurship is seen as a promising approach aiming to solve complex social, environmental, and economic problems with innovative solutions. Whilst the concept of collaboration provides an important conceptual overlap between the entrepreneurship and sustainability literatures, it has so far received little attention in sustainable entrepreneurship research. The purpose of this article is to explore links between collaborative entrepreneurship and sustainable development. Sustainability challenges increase the importance for entrepreneurial collaboration in three ways: first, for cross-actor participation within entrepreneurial processes; second, for coordinating across sustainability issues and between entrepreneurial solutions; and third, for cross-sector cooperation between different forms of entrepreneurship such as social entrepreneurship, sustainable entrepreneurship, and policy entrepreneurship. We show how understanding this link between collaborative entrepreneurship and sustainable development sheds new light on both entrepreneurship theory and practice as well as sustainability research.

Keywords: sustainable entrepreneurship; sustainable development goals; UN SDGs; collaborative entrepreneurship; sustainable development; environmental entrepreneurship; social entrepreneurship; policy entrepreneurship; United Nations.

Reference to this paper should be made as follows: Schaltegger, S., Beckmann, M. and Hockerts, K. (2018) 'Collaborative entrepreneurship for sustainability. Creating solutions in light of the UN sustainable development goals', *Int. J. Entrepreneurial Venturing*, Vol. 10, No. 2, pp.131–152.

Biographical notes: Stefan Schaltegger is a Professor of Corporate Sustainability Management and Head of the Centre for Sustainability Management and the MBA Sustainability Management at the Leuphana University Lüneburg, Germany. His research covers various areas of corporate sustainability management, CSR, sustainable entrepreneurship, and stakeholder theory. He has more than 400 publications, including articles in *Business Strategy and the Environment*, *Journal of Business Ethics*, *Long Range Planning*, *European Management Journal*, *Organization & Environment*, *Journal of World Business*, *Journal of Industrial Ecology*, *Supply Management. An International Journal*, *Accounting, Auditing and Accountability Journal*, *Accounting and Organizational Change*, *British Accounting Review*, *Journal of Cleaner Production*, *Ecosystem Services* and *Ecological Economics*.

Markus Beckmann is a Professor for Corporate Sustainability Management at the Friedrich-Alexander University of Erlangen-Nuremberg, Germany, since 2012. Between 2009 and 2012, he was an Assistant Professor for Social Entrepreneurship at the Centre for Sustainability Management at the Leuphana University in Lueneburg. His research interests include corporate sustainability management, CSR, social entrepreneurship, and business ethics. His work has appeared in journals such as *Business Ethics Quarterly*, *Business Strategy and the Environment*, *Business and Society*, *Journal of Business Ethics*, *Journal of Purchasing and Supply Management*, and *Non-Profit and Voluntary Sector Quarterly*.

Kai Hockerts is a Professor in Social Entrepreneurship at the Copenhagen Business School (CBS). In his function as an Academic Director of Responsible Management Education, he is also leading the CBS curriculum change initiative anchoring responsible management education across the curriculum. His research focus is on corporate sustainability strategies and social entrepreneurship. He holds a PhD in Management from the University of St. Gallen. His research has been published in the *Journal of Business Venturing*, *Entrepreneurship Theory and Practice*, *California Management Review*, *Journal of Business Ethics*, and *Business Strategy and the Environment*.

1 Introduction

In 2015, the 193 nations of the UN General Assembly adopted the '2030 Development Agenda' titled 'transforming our world' (UN, 2015). At the core of this agenda are the 17 'sustainable development goals' that spell out a vision for a sustainable future of humankind on our shared planet. Including objectives such as 'no poverty', 'good health and well-being', 'climate action' or protecting 'life below water' and 'life on land', the first 16 SDGs provide a globally agreed upon framework as to *what* the great transition towards sustainability should achieve. Moreover, the 17th SDG also indicates *how* to bring about this transition: through 'partnerships for the goals'. The global agenda for transforming the world thus highlights the role of collaboration for sustainability.

This paper brings together the UN SDG's idea of collaboration with the practice and theory of entrepreneurship and, more specifically, sustainable entrepreneurship. In fact, we contend that the concept of collaboration provides an important conceptual overlap between the entrepreneurship and sustainability literatures that, so far, has received only little attention. Over the past years, entrepreneurship research has begun to emphasise the

role of collaboration and networks for innovation in a complex environment (e.g., Larson, 2000; Miles et al., 2005; Rocha and Miles, 2009). At the same time, sustainability research has long underlined the role of inter- and trans-disciplinary cooperation to solve complex challenges characterised by the interdependence of economic, social, and environmental aspects (e.g., Jahn et al., 2012; Lang et al., 2012; Wiek et al., 2012; Schaltegger et al., 2013).

The purpose of this article is to explore this link between collaborative entrepreneurship and sustainable development in more detail. Our key claim is that the challenge of sustainable development increases the importance for entrepreneurial collaboration and collaborative entrepreneurship in three ways. First, sustainable development increases the need for cross-actor participation within entrepreneurial processes. Second, it increases the need for cross-issue coordination between entrepreneurial solutions. Third, it increases the need for cross-sector cooperation between different forms of entrepreneurship such as social entrepreneurship, sustainable entrepreneurship, and policy entrepreneurship. We show how understanding this link between collaborative entrepreneurship and sustainable development sheds new light on both entrepreneurship theory and practice as well as sustainability research.

We develop our argument in the following three steps. In the first step, we briefly review the (sustainable) entrepreneurship debate and identify four developments that have broadened the entrepreneurship concept and thus advanced its relevance for sustainable development:

a a richer appreciation of diverse motivations that drive entrepreneurs

b a richer understanding of different forms of entrepreneurship

c a richer notion of the importance of collaboration, context and eco-systems in entrepreneurship

d an extended perspective of creating a priori non-existing opportunities rather than discovering existing opportunities.

In the second step, we introduce and discuss the UN SDGs in more detail. Here, our analysis serves to show that the very nature of sustainable development calls for two kinds of collaboration. Given complex interdependencies between the individual SDGs, sustainable development requires *horizontal collaboration* to address potential synergies and the challenge of non-intended consequences *across sustainability issues*. Given the multi-level nature of societal transformation and governance, sustainable development requires *vertical collaboration* to coordinate the interplay between individuals, business ventures, civil society, and policy makers *across sectors and governance levels*.

In the third step, we then bring together the perspective of collaborative entrepreneurship and sustainable development's need for entrepreneurial collaboration. Here, we discuss the three types of collaborative entrepreneurship. The article closes with conclusions for entrepreneurs and sustainability research.

2 A brief review of entrepreneurship research: four relevant developments

Ever since Schumpeter's (1962/1934, 1939) seminal work, entrepreneurship has been studied as a 'process of creative destruction'. At the heart of entrepreneurship lies the

idea of innovation (Drucker, 1986) as entrepreneurs bring new solutions to the world, thus destroying and replacing previous ways of doing things. Entrepreneurial innovations can come in many forms, including new products and new processes but also new markets or new factor inputs. In a nutshell, entrepreneurship describes the processes of entrepreneurs as actors who discover, realise and create opportunities for developing novel and superior solutions out of the former status quo (Stevenson and Gumpert, 1985).

For sustainability, entrepreneurship is highly important because the transformation towards a sustainable future urgently requires the creative destruction of unsustainable patterns of producing, consuming, and living. Against this background, the concept of sustainable entrepreneurship has gained prominence (Cohen and Winn, 2007; York and Venkataraman, 2010; Schaltegger and Wagner, 2010; Fellnhofer et al., 2014). Sustainable entrepreneurs find ways to creatively destroy market failures (Hart and Millstein, 1999; Dean and McMullen, 2007) as well as government and bureaucracy failures that result in negative social and environmental externalities. By bringing new, more sustainable innovations to the world, they can play an important role in creating sustainability transformations.

Over the past decades, research on entrepreneurship and also, more specifically, sustainable entrepreneurship, has flourished and yielded rich scholarly progress. While a detailed review goes beyond the scope of this paper, four developments deserve closer attention for our purposes: motivations driving entrepreneurs, forms of entrepreneurship, the importance of collaboration and context in entrepreneurship, and the relevance of effectuation and creation.

2.1 Motivations for entrepreneurship: from money to multiple motives

From an economic perspective, entrepreneurship generates entrepreneurial rents when innovations creatively destroy the existing market equilibrium and generate new market disequilibria. Entrepreneurship is then concerned with the discovery, profitable exploitation and active creation of business opportunities out of these new market disequilibria (Shane and Venkataraman, 2000). Over time, as competitors imitate the entrepreneur, these imitators move the market towards a new (temporary) equilibrium and erode entrepreneurial rents.

Given this important economic role, entrepreneurs have traditionally been viewed as economic actors motivated by financial considerations. Along these lines, various authors suggest that sustainability-oriented entrepreneurs are driven by financial benefits related to offering social and environmental solutions (Dean and McMullen, 2007; York and Venkataraman, 2010). Several case studies and extant empirical research, however, show that with some exceptions many if not most sustainability-oriented entrepreneurs may primarily be motivated to contribute to sustainable development rather than conventional profit maximisation and that motivation for environmental, social and sustainable entrepreneurship are often linked well to individual values of the entrepreneurs and the passion for sustainable business (Choi and Gray, 2008a, 2008b; Kirkwood and Walton, 2010; Schaltegger and Hansen, 2013; Shepherd et al., 2013; Koe and Majid, 2014; Koe et al., 2014).

Various authors adapted entrepreneurial intention theory (Mair and Noboa, 2006; Krueger, 1993; Krueger et al., 2000) and, in particular, the theory of planned behaviour (TPB) (Ajzen, 1991) to sustainable and social entrepreneurship. The TPB has been widely tested in for-profit entrepreneurship research and has been proven accurate in

predicting entrepreneurial intentions and behaviour (Kautonen et al., 2015). Mair and Noboa (2006) adapted the TPB so that it can be applied to sustainable entrepreneurship by proposing four key antecedents: empathy (to model attitudes), moral judgment (to model social norms), self-efficacy (to model internal behavioural control), and perceived presence of social support (to model external behavioural control). While the latter two variables have been found to be strong predictors, findings for empathy and moral judgment have been unsystematic (Ernst, 2011; Forster and Grichnik, 2013; Hockerts, 2017).

While not all entrepreneurs dealing with sustainability strive to change the world (Allen and Malin, 2008; Choi and Gray, 2008a), empirical research, however, shows that primary motivations for many actors to engage in sustainable entrepreneurship are to spread their green values, to educate society, and to follow their passion for a green business idea (Kirkwood and Walton, 2010; Shepherd et al., 2013). Koe and Majid (2014) and Koe et al. (2014) further argue that attitudes and values linked to sustainability (i.e., a sustainability orientation) motivate individual entrepreneurs to engage in environmentally friendly practices and positively affect their intention to engage in sustainable entrepreneurship.

In short, sustainable entrepreneurship scholarship has come to a much more nuanced understanding of the diverse and often multiple motivations that drive entrepreneurs. Entrepreneurs may be concerned with financial objectives (Choi and Gray, 2008a; Rogers, 2010) or growth (Kearins and Collins, 2012) but they may also follow ideas of self-development, the objective to gain power and influence, or pro-social/environmental motivations. Such a broadened perspective is particularly helpful for our purposes because it allows applying the entrepreneurship lens to complex sustainability challenges characterised by diverse actors with diverse interests.

2.2 From business ventures to multiple form of entrepreneurship in different settings

Traditionally, entrepreneurship has been associated with business venturing and newly founded enterprises. In fact, much of the entrepreneurship literature still focuses on business start-ups and new ventures. Similarly, in the field of sustainable entrepreneurship (e.g., Cohen and Winn, 2007; Dean and McMullen, 2007; Hall et al., 2010; Hockerts and Wüstenhagen, 2010; Shepherd and Patzelt, 2011; Schaltegger and Wagner, 2010) or eco-venturing (Hockerts, 2004; Pepin, 2005; Choi and Gray, 2008b; Jolink and Niesten, 2015; Muñoz and Cohen, 2017a, 2017b) the founding of new ventures has received considerable attention. Given the focus on innovation of the entrepreneurship concept, a prominent attention to start-ups and business ventures is not surprising. Compared to established incumbents characterised by path-dependencies, young organisations often find it easier to be flexible and generate path-breaking innovations (Hockerts and Wüstenhagen, 2010; Schaltegger et al., 2016).

Over the past decades, entrepreneurship scholarship has broadened this traditional focus on business start-ups in two ways. First, the debate on entrepreneurship has highlighted that entrepreneurs also act within existing organisations (Pinchot, 1988; Gapp and Fisher, 2007). Sustainable entrepreneurs seek to transform from within existing organisations towards sustainability. Second, there are rich strands of research that have applied entrepreneurship as a more general concept to settings outside the business (start-up) domain. This includes the idea of 'institutional entrepreneurship' (Tracey et al.,

2011) as a general process of creating new institutions that govern important aspects of organisational or societal life; 'social entrepreneurship' (Seelos and Mair, 2005; Martin and Osberg, 2007; Whitman, 2011) as the entrepreneurial solutions of social challenges that may also occur in the non-profit sectors, 'academic entrepreneurship' (Shane and Venkataraman, 2000; Shane, 2004; Leyden and Link, 2013) that focuses on processes bringing about innovative solutions in the university context as well as 'policy entrepreneurship' (Mintrom, 1997) in the political domain.

In sum, instead of restricting the entrepreneurship concept to business start-ups and the market domain, a more general notion of entrepreneurship as the active implementation of change through innovation allows using the entrepreneurship perspective as a powerful lens to look at, compare with, relate to, and learn from innovation processes in the market, civil society, academia, and the state. This is relevant for our purposes as sustainability solutions require the contribution of all these sectors.

2.3 From individual entrepreneurship to the importance of context and collaboration

Popular iconic entrepreneurs like Steve Jobs and their media portrayal have nurtured the view that entrepreneurship is largely driven by the determination and ingenuity of hero-like individuals. While taking a much more rational and scientific perspective, an important strand of entrepreneurship research started similarly by investigating the personality features of (successful) entrepreneurs (e.g., Kets de Vries, 1977; Hockerts, 2004). This line of research has generated important concepts such as the idea of 'entrepreneurial orientation' (e.g., Lumpkin and Dess, 1996) and sustainability orientation of entrepreneurs (e.g., Kuckertz and Wagner, 2010) and other concepts to measure relevant personality features. At the same time, looking at entrepreneurship with a focus on the individual entrepreneur fails to understand the context and social embeddings of entrepreneurial processes.

Against this background, a number of more recent developments in entrepreneurship research have broadened the perspective away from individual entrepreneurship to the socially embedded, collective, and collaborative dimension of entrepreneurship.

In terms of social embeddedness, the idea of entrepreneurial eco-systems (Cohen, 2006; Zahra and Nambisan, 2011; Isenberg, 2011) highlights that entrepreneurial innovation does not occur in a vacuum but rather interacts with and requires an appropriate 'entrepreneurial infrastructure' (Van de Ven, 1993). The process of entrepreneurship is thus a collective achievement that includes other key private and public actors (such as other entrepreneurs, research partners, and regulators), shared processes and relations (Cohen, 2006; Mason and Brown, 2014; Pinkse and Groot, 2015).

Going beyond the idea of mere context or social embeddings, other scholars have highlighted that in many cases the very agents in entrepreneurial innovation are not isolated individuals but teams or groups of individuals (e.g., Tencati and Zsolnai, 2009; Wheeler et al., 2005). By this logic, the idea of 'collective entrepreneurship' has been studied in both conventional entrepreneurship research (e.g., Rocha and Miles, 2009; Leyden and Link, 2013; Ratten, 2014) and in the social entrepreneurship literature (e.g., Montgomery et al., 2012).

In more general terms, various strands of research underline the importance of collaboration in entrepreneurship. The business model literature, e.g., emphasises the role of key partners and collaborative value creation (e.g., Schaltegger et al., 2017). As a key foundation in sustainability and corporate sustainability scholarship, stakeholder theory (Hörisch et al., 2014) similarly highlights that entrepreneurs never create value in a black-box but rather in the dense cooperation with diverse stakeholders. Knowing one's relevant stakeholders, their interests and the resources they can provide is thus crucial for entrepreneurship and sustainability entrepreneurship in particular (Schlange, 2006).

2.4 From opportunity identification and seeking to effectuation and creating opportunities

Entrepreneurship is often linked to the specific alertness and knowledge required to discover business opportunities (Hayek, 1945; Kirzner, 1973), while these opportunities are seen to exist separate of the entrepreneurs themselves (Sarasvathy and Dew 2005; Sarasvathy, 2001, 2008). The discovery of opportunities view assumes that strategic planning and marketing are key approaches of entrepreneurship and that a causal relationship exists between discovery of opportunities, adequate management and market success (Sarasvathy, 2008). This perspective has also informed early research on ecopreneurship (e.g., Dixon and Clifford, 2007; Jolink and Niesten, 2015; Schaltegger, 2002).

The opportunity seeking view has been extended by the effectuation perspective that opportunities can arise outside of markets and be enacted by entrepreneurs (Sarasvathy and Dew, 2005; Sarasvathy et al., 2013). From this perspective, entrepreneurs initiate creative processes based on their own motivations, skills and networks (Sarasvathy, 2001, 2008). Effectuation describes the process that entrepreneurs create (a priori non-existent) opportunities through their own capabilities, including their personality, knowledge, and networks (Sarasvathy, 2001). The effectuation and creation view of entrepreneurship receives additional relevance in light of the high uncertainty often characterising sustainability problems (e.g., Wiek et al., 2012) and their societal and ecological character beyond markets. As many sustainability problems root outside markets, they are mostly not directly related to existing market opportunities but first and foremost rather represent economic dis-opportunities. Entrepreneurial opportunities relating to sustainability are thus often rather created intentionally and collectively rather than 'waiting to be recognised and realised' and in spite of a priori inexistence of opportunities. This creation of sustainability related opportunities against all odds can be the result of a pragmatic co-creation of innovations leading to transformations of markets and beyond.

Co-creation is one of the major sources of potential tensions in sustainable entrepreneurship. Traditional businesses are protective of their unique knowledge. Due to their inherent motivation to transform industries sustainability entrepreneurs, on the other hand, are more willing to share their insights with potential competitors for as long as they support the underlying sustainability mission. Danish social entrepreneur Torkil Sonne, for example, has reached out to large firms such as SAP, IBM, and Accenture sharing insights from his own social enterprise Specialisterne on how to

integrate high functioning autists into the work place. As a result there is already an increasing demand for such employees as the approach of Specialisterne has been duplicated in Germany and the Netherlands by Specialisterne copy-cats. Tesla Motor is another example in which a sustainability entrepreneur openly shares his knowledge with competitors. In 2014, Tesla made its patents in areas such as electrical motors and batteries freely available (Rimmer, 2014). The logic behind this decision was that the bigger the market for electrical cars gets the more Tesla is likely to be able to leverage its position as a sustainability pioneer. Moreover, by sharing its patents Tesla may be able to install its own technology as the de facto market standard.

In short, entrepreneurship scholarship has advanced its perspective to highlight the interdependence of multiple actors in entrepreneurial ecosystems, to bring attention to the social, often collective dimension of entrepreneurial processes, to acknowledge the creation of opportunities in addition to or rather than finding pre-existing opportunities, and, most importantly, to emphasise the role of participation, coordination and collaboration for entrepreneurship. Though the literature on sustainability entrepreneurship has not discussed this importance of collaboration in depth, collaboration is of particular relevance at the link between entrepreneurship and sustainability. The next sections serve to substantiate this claim.

3 The UN Sustainable Development Goals and the need for collaboration

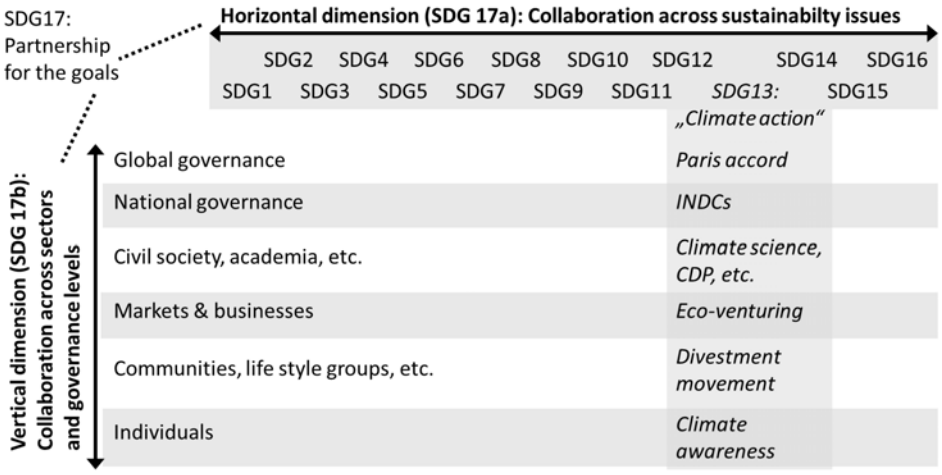
After many years of intensive consultations, the 193 nations of the UN General Assembly adopted in 2015 the '2030 Development Agenda' titled 'Transforming our world'. This shared global agenda contains 17 'sustainable development goals', 169 proposed targets for these goals, and 304 proposed indicators to measure progress (UN, 2015). The 17 SDGs include:

1	no poverty	10	reduced inequalities
2	zero hunger	11	sustainable cities and communities
3	good health and well-being	12	responsible consumption and production
4	quality education	13	climate action
5	gender equality	14	life below water
6	clean water and sanitation	15	life on land
7	affordable and clean energy	16	peace, justice and strong institution
8	decent work and economic growth	17	partnership for the goals.
9	industry innovation and infrastructure		

At first sight, the UN SDGs thus have a clear social emphasis with many goals focusing primarily on social issues (e.g., 1, 2, 3, 4, 5, 8, 10, and 16). Compared to the UN Millennium Goals, however, ecological issues are considered somewhat more explicitly, with some goals explicitly focusing on the environment (13, 14, and 15) and others relating to socially and environmental issues alike (e.g., 11 and 12). While the first 16 SDGs spell out a shared vision of where humanity aspires to be by 2030, the 17th and final SDG does not really formulate a material objective but rather specifies a process goal regarding how the global community intends to achieve the 16 aforementioned SDGs.

The SDGs spell out a shared agenda for sustainable development. As such, they provide a framework for collaboration on a global scale. With goal 17 'Strengthen the means of implementation and revitalise the global partnership for sustainable development', the SDGs explicitly emphasise this need for collaboration. As this article seeks to show, the reason for this emphasis is that the complexity and interdependence of sustainability challenges creates a special need for collaboration in two ways. The very nature of the sustainable development challenge creates a pronounced need for horizontal collaboration across sustainability issues as well as the need for vertical collaboration across sectors and governance levels (Figure 1).

Figure 1 The UN SDGS and the need for horizontal and vertical collaboration



In the following, we develop the idea in more detail.

3.1 Horizontal collaboration across the SDGs

As Figure 1 illustrates, the horizontal dimension refers to the importance of cross-issue collaboration across the different SDGs. The underlying idea is to address the different SDGs not in an isolated, individual fashion but to aim at holistic approaches that address the SDGs as a whole. Horizontal collaboration is necessary because sustainability cannot be reduced to a single issue such as, say, climate change. While each individual goal is, of course, important, the very concept of sustainable development highlights the interdependence of social, environmental, and economic issues (e.g., WCED, 1987), and thus the interdependence of the different SDGs.

To illustrate, take the prominent and urgent goal to eradicate hunger (2) which calls for an increase and fairer distribution of the effective global food production. Potential approaches to expand the global food supply include turning virgin forests into farmland, pumping up ground water for artificial irrigation or using more industrial fertilisers and pesticides. While such practices might increase food production and promote SDG 2, they could come, however, at the risk of destroying clean freshwater access (SDG 6) and habitat on land (SDG 15) or counteract climate action (SDG 13). Similarly, promoting

climate action (SDG 13) through the production of bio-fuels might worsen food shortages (SDG 2) and contribute to destroying habitats (SDG 15).

The lesson to be learnt here is that a too narrow perspective on individual SDGs runs the risk of achieving alleged improvements in one goal dimension at the expense of other SDGs, thus undermining sustainable development as a whole. To avoid such unintended consequences and to overcome the underlying unproductive trade-offs requires, however, a broad understanding of the complex interdependencies between the various SDG dimensions. Given the complexity of this challenge, no individual actor is capable of having such a broad perspective. No company that invests in new bio-fuel technologies can be simultaneously an expert for climate change, the rights of indigenous people, bio-diversity, and so forth. This is why players who truly seek sustainable development cannot act isolated from each other. Rather, what is needed is inter- and trans-disciplinary participation and collaboration (Lang et al., 2012) that is able to include the expertise of diverse perspectives.

Underlying the SDGs as a broad framework, the idea of horizontal collaboration thus emphasises that one dimension of trans-disciplinary cooperation needed for sustainability is the openness to collaborate across different sustainability issues and thus to coordinate their individual sustainability contributions in a productive way. This may help to deal with the 'directional risks' (Paech, 2007) of unintended consequences of sustainability innovations. Moreover, bringing together diverse pieces of knowledge from very different fields can lay the groundwork for innovations that even realise synergies between the different SDGs and sustainability issue areas.

3.2 Vertical collaboration across sectors and governance levels

The 2015 declaration of the UN SDGs marked the culmination of an intense multi-stakeholder dialogue. In fact, the SDGs were created over several years through the collaborative consultation of representatives from multi-national organisations, governments, civil society organisations, the academia, and business (UN, 2015). By building on the collaboration of actors from different societal sectors and different governance levels, the SDGs themselves can be seen as a product of trans-disciplinary cooperation.

This cooperation across different sector logics and governance levels is what the vertical dimension of sustainability collaboration is about. The vertical dimension in Figure 1 illustrates this idea. The notion of vertical collaboration highlights that even within one specific SDG or sustainability issue typically no single actor can fully solve a sustainability challenge. The reason is that almost all global sustainability challenges need to be understood against the background of society's multi-level governance. In this multi-level system, different sectors and different actors have specific roles and potential contributions that need to be brought together in order to transform society as a whole. Multinational-organisations can provide global governance institutions, while nation states provide national regulation. Academia can promote education and research. Civil-society actors can fulfil an advocacy function or provide social and environmental services. Businesses provide not only products and services but can also create jobs, taxes, and knowledge. Acknowledging the complexity and multifaceted character of sustainability problems and to create sustainability solutions requires inter- and trans-disciplinary collaboration inside the company between different departments and actors

(Schaltegger et al., 2013) as well as between the company and its stakeholders (Hörisch et al., 2014).

Seen from this perspective, sustainability challenges arise where the interplay of the different actors is in an unsustainable equilibrium that creates negative social and environmental externalities. Creatively destroying such equilibrium often requires innovations and collaboration across the different governance levels and sector logics.

To illustrate, take the example of SDG 13 (climate action; exemplified in Figure 1). Within this given issue, no single actor or sector can individually achieve this goal. Fighting the complex challenge of climate change rather requires changes on many governance levels and a productive interplay between these innovations. On the level of multi-national governance, the Paris accord represents the attempt to establish a process for developing global rules to fight global warming. To implement such rules, however, governments need to translate their intended nationally determined contributions (INDCs) into policies on the national level. In the market, clean-tech ventures are needed to create new business models while climate finance can create novel funding instruments. Civil-society organisations such as the carbon-disclosure project can provide the advocacy to create transparency and to promote corporate accountability, while the academia can engage in climate-related teaching and research. Finally, on the level of individual behaviour, social movements such as the fossil fuel divestment campaign and other activists can foster cultural change towards more responsible consumption and climate awareness which also feeds back into market incentives and the political arena.

What this simple example shows is that comprehensive solutions for sustainability challenges need to understand and build upon the interdependence of different sectors and governance levels. Companies can create novel products and services, yet they cannot establish regulation, and the market success of their sustainable offers depends on market conditions, too. Governments can regulate markets but they cannot enforce cultural change. It is this interplay of different actors within an issue domain that vertical collaboration is about. Given the often systemic and complex nature of sustainability challenges, sustainability creates a special need for such vertical collaboration. Trans-disciplinary cooperation is then needed that can bring together the languages and logics of different societal sectors and governance levels.

3.3 The need for collaborative innovation

This discussion of the SDGs has highlighted that due to its characteristic complexity and interdependence sustainability typically requires innovations that no single actor can provide individually. No single actor has either the diverse knowledge nor the resources and capabilities necessary to promote a fundamental sustainability transition of markets and society. What is therefore needed is trans-disciplinary collaboration, both horizontally (across issues and SDGs) and vertically (across sector logics and governance levels).

Such collaboration, however, is not easy. On the contrary, finding adequate forms and processes for trans-disciplinary collaboration requires innovations for successful partnerships. This is why the SDGs highlight the development of partnerships as a separate and important goal. As this is process-oriented goal as well as the other 16 issue-oriented goals require both collaboration and innovation, the next section focuses on how collaborative entrepreneurship can foster such cooperative solutions.

4 Collaborative entrepreneurship and sustainable development

As the previous two chapters have shown, the issue of collaboration provides a fruitful conceptual overlap between the domains of entrepreneurship and sustainable development. This section now discusses this overlap in more detail. More specifically, we link three ways of how sustainability increases the need for collaboration with relevant concepts and discussions in the theory and practice of (sustainable) entrepreneurship. First, sustainability creates the need for cross-stakeholder collaboration and co-creation within entrepreneurial processes. Second, sustainability increases the need for cross-issue coordination and consultation between entrepreneurial solutions. Third, sustainability calls for increased cross-sector cooperation between different forms of entrepreneurship.

4.1 Collaboration within entrepreneurial ventures: co-creating for sustainability

The SDGs and its 169 sub-targets illustrate that non-sustainability can be broken down to diverse and manifold individual sustainability challenges. For each of these issues, solutions are needed that call for innovation and creative destruction. Here, sustainable entrepreneurship can serve as an important driver to foster such concrete solutions. Table 1 provides an overview of the 16 material SDGs and gives illustrative examples of possible sustainable entrepreneurship projects and ventures, starting points, and references.

Given the complex nature of many phenomena of unsustainability such as good health and wellbeing or responsible consumption and production sustainability-related opportunities are rarely apparent and solutions mostly not ‘externally given’. Whereas some sustainability incurred opportunities may be apparent, most are not ‘waiting’ to be picked up by an individual. They rather need to be created with purpose, much effort and in collaboration with a set of actors. The illustration examples of sustainable entrepreneurs in Table 1 demonstrate that this is also what characterises the entrepreneurial praxis with regard to the different SDGs.

Against this background, the literature on sustainable innovations has emphasised the need for open-innovation approaches (Klewitz and Hansen, 2014; Adams et al., 2016). Including diverse stakeholders such as consumers, workers, communities, and suppliers into the innovation process enables entrepreneurs not only to find novel solutions but also to implement such solutions through co-creation. As discussed in the section on the motivations that drive sustainable entrepreneurship, a shared vision of sustainability can provide a common sense of purpose that helps coordinate diverse actors. Consequently, sustainability does not only increase the need for collaboration within entrepreneurial projects but can also make such collaboration more likely. A potential drawback of entrepreneurship focused on particular SDGs and sustainability issues is, however, that a broader, overarching perspective of sustainable entrepreneurship might get lost. Sustainable entrepreneurship thus requires cross-issue collaboration, too.

Table 1 UN SDGs and collaborative sustainable entrepreneurship venture potential

UN SDGs		*Possible sustainable entrepreneurship projects and ventures (examples)*	*Offers of sustainable entrepreneurs providing … (examples)*	*References of social, environmental and sustainable entrepreneurship literature (examples)*
1	No poverty	Providing micro-credits and microfinance	Microcredit banking *Example:* Gramin bank – http://www.grameen.com/	Yunus and Weber (2007), Kent and Dacin (2013)
2	Zero hunger	Community food security; improvement of agricultural structures and practices	Agricultural consulting; establishing food cooperatives; local food systems for organic food production and branding *Example:* Grace Food Program – http://www.sustainabletable.org/	Allen (1999), Marsden and Smith (2005); Hall et al. (2012)
3	Good health and well-being	Creating country doctor services; offering healthy food; financing sports facilities for the public	Country doctor services; healthy food offers; sports facilities and services *Example:* HealthPoverty – http://www.healthpovertyaction.org	Seelos and Mair (2005), Oborn et al. (2011), Oham and Macdonald (2016)
4	Quality education	Providing good education in the remote areas	(Remote) education offers for population in remote areas and for young women *Example:* Educational entrepreneurship – http://nextbillion.net	Din (2017), Smith and Petersen (2006)
5	Gender equality	Providing good education for young women; organising diversity events	Schooling and schools for women; microfinance offers for women; diversity events *Example:* HelloFearless – http://hellofearless.com	Tambunan (2009), Malach Pines et al. (2010)
6	Clean water and sanitation	Drinking water and sanitation infrastructure, water cleaning; freshwater saving equipment; freshwater basin restoration projects	Technical and organisational solutions to provide sanitation, reduce freshwater use, restore freshwater basins and increase availability/renewability of drinking water *Example:* DrinkWell – http://drinkwellsystems.com/	Montgomery et al. (2009)
7	Affordable and clean energy	Planning, organising, financing and maintaining renewable energy and energy saving projects	Technical and organisational solutions for wind, solar, hydro and biomass energy; technical and organisational solutions to reduce energy consumption *Example:* African solar entrepreneurs – http://www.bbc.com/news/business-30805419	Wüstenhagen and Wuebker (2011)
8	Decent work and economic growth	Offering jobs with good working conditions and fair salaries	Organisations with decent work and inclusive work providing jobs for handicapped and multiple employment difficulties *Example:* Dialogue in the dark – http://dialog-in-hamburg.de/en	Wang et al. (2015)

Table 1 UN SDGs and collaborative sustainable entrepreneurship venture potential (continued)

UN SDGs		*Possible sustainable entrepreneurship projects and ventures (examples)*	*Offers of sustainable entrepreneurs providing … (examples)*	*References of social, environmental and sustainable entrepreneurship literature (examples)*
9	Industry innovation and infrastructure	Developing clean and sustainable industry innovations and infrastructure	Sustainable industry sites and parks; water infrastructure, etc. *Example:* Urbanpreneurs; entrepreneurs rebuilding poor communities – http://www.citylab.com	Hall et al. (2012), Van Slyke and Newman (2006), Cohen and Muñoz (2016)
10	Reduced inequalities	Redistributing wealth; enabling people to participate in markets and to create own businesses	Entrepreneurial charity organisations *Example:* UnreasonableGoals – http://unreasonable-goals.com/	E.g., Pepin (2005), Acs and Dana (2001), Spencer et al. (2008)
11	Sustainable cities and communities	Developing new sustainable cities; renovating and redesigning existing neighbourhoods and houses	Sustainable cities and neighbourhoods; safe neighbourhoods; affordable sustainable houses *Example:* GreenCitySolutions – http://greencitysolutions.de	Cornwall (1998)
12	Responsible consumption and production	Developing healthy food, sustainable clothes, etc.	Healthy school food *Example:* Jamie Oliver's initiative for healthy school food – http://www.jamiesfoodrevolution.org	Ikerd (2011), Hollows and Jones (2010), Weaver-Hightower (2011)
13	Climate action	Developing carbon free products, electricity and infrastructure; carbon compensation services	Climate compensation services, tree planting organisations, etc. *Example:* Plant a tree organisation – http://www.iplantatree.org/home	Alvord et al. (2004)
14	Life below water	Developing sustainable fishing	Standards and organisations for sustainable fishing *Example:* Marine Stewardship Council (MSC) – http://www.msc.org/	Constanze and Bonanno (2000)
15	Life on land	Managing a wilderness park; establishing eco-tourism; creating products that save ecosystems	Eco-tourism offers; wildness park adventures; products supporting rural communes and culture, etc. *Example:* Ecopreneurist – http://www.ecopreneurist.com/ecotourism	Lordkipanidze et al. (2005)
16	Peace, justice and strong institutions	Establishing peace keeping and security services	Peace keeping and security services, sport for peace events *Example:* 'Sport for Development and Peace' event organisation – http:// www.peace-sport.org/	Kidd (2008)

4.2 Cross-issue collaboration between entrepreneurial process: coordinating for sustainability

In practice, partial solutions or foci on specific SDGs may be what can be handled by entrepreneurs. The danger, however, is that partial solutions may have side-effects like rebound effects that hamper the overall achievement of sustainable development. Thus, as highlighted in our discussion of the need for horizontal collaboration, sustainable development calls for collaboration across issues and individual, partial solutions. Applied to the entrepreneurship perspective, this implies that collaboration is needed not only within entrepreneurial projects but also between entrepreneurial projects.

So far, the idea of cross-project and cross-issue entrepreneurship has received little attention in the literature – with two exceptions. First, one classical interpretation of the role of the entrepreneur is that entrepreneurs are arbitrageurs that exploit the lack of adequate flows within the economy. In fact, Jean-Baptiste Say who coined the very term 'entrepreneurship' defined the entrepreneur as the one who "shifts economic resources out of an area of lower and into an area of higher productivity." [cited in Martin and Osberg, (2007), p.31]. Entrepreneurship then is about productively connecting so-far unconnected domains; an idea that could also be applied to cross-issue innovation. Here, sustainable entrepreneurship could play an important role in creating synergies by bringing together so-far unrelated social, environmental, and economic challenges and activities aiming to solve various sustainability problems related to different SDGs.

A second concept from the entrepreneurship literature that could be applied to the collaboration between entrepreneurial projects is the idea of entrepreneurship. Entrepreneurs innovate and create value by organising productive collaboration between existing organisations (e.g., Richter and Teramoto, 1995). Given the existence of an increasing number of sustainability-oriented ventures, for example in the green-tech sector, entrepreneurs could organise cross-organisational collaboration able to expand the often-narrow scope of single-issue green or social start-ups.

In sum, entrepreneurial cross-issue collaboration of coordinating and linking different entrepreneurial projects is needed to realise the synergy potential between partial projects and to impede or reduce undesired side-effects. Despite some concepts like arbitrage and entrepreneurship, the sustainable entrepreneurship literature has so far paid little attention to this question. This opens up interesting opportunities for future research, and it also raises the question of how contributions to sustainable development can have an impact beyond small projects, single issues, and niches.

4.3 Cross-sector collaboration between different entrepreneurship types: scaling for sustainability

Our analysis of the UN SDG framework (Figure 1) highlights that the transformation towards sustainability also has a vertical dimension: it requires changes and innovations across sectors and diverse governance levels. In each of these domains, creative destruction is needed to overcome unsustainable equilibrium on different levels of global governance, markets, society, academia, etc.

As our first chapter has reviewed, by generalising the idea of entrepreneurship, the literature has spawned a rich set of concepts that analyse entrepreneurial processes in different societal sectors and on different governance levels. To start with, the concept of 'policy entrepreneurship' (Mintrom, 1997) looks at how entrepreneurs identify opportunities in the policy domain by transferring ideas from one domain to another. One example of such processes in the field of sustainable development is the fight of policy entrepreneurs like Peter Eigen, founder of Transparency International, against the unsustainable equilibrium of enduring corruption in many regions of the world. Peter Eigen and Transparency International not only built a strong argumentative case against corruption but brought concrete policy ideas to fight corruption to multinational organisations like the World Bank and the IMF, thus inducing change on the global governance level. In an effort of collaborative entrepreneurship, like-minded individuals around the globe started local Transparency International chapters to lobby their governments and to fight corruption through partnerships with businesses and other local stakeholders.

On the level of the market, sustainable entrepreneurs around the world innovates more sustainable products and services. Interestingly, many sustainable entrepreneurs collaborate with policy-makers or collaborate with each other to create self-regulation for establishing new markets. To illustrate, much of the sustainable and organic food industry began by creating private standards and certifications (e.g., Demeter for organic food, or the Marine Stewardship Council for sustainable fishing) that in some cases later inspired public regulation of the food industry (e.g., the EU organic food label).

In the non-profit and community domain, social entrepreneurs have created novel solutions to address the needs of disenfranchised stakeholders such as the disabilities or families without access to education. In most welfare states, these innovators for the public good closely collaborate with cities, social security systems, and legislators. In fact, many business models in social entrepreneurship emerge at the intersection of the sector logics of the market, the state, and the community, often combining resources from all sectors.

Similarly, academic entrepreneurs who promote new ways of teaching or research often cooperate with partners in other sectors. Finally, cultural entrepreneur who promote new ideas often do this as part of social movements that contribute to changing awareness, thus laying an important foundation for cooperation with other actors.

In short, transformations towards sustainability require contributions of and collaboration between different forms of entrepreneurship. Sustainable business entrepreneurship, social entrepreneurship, academic entrepreneurship, cultural entrepreneurship, and policy entrepreneurship all hold important pieces of the puzzle needed to foster sustainable development. In a number of examples, collaboration across these various forms of entrepreneurship and sector boundaries already takes place. Our analysis suggests that collaborative entrepreneurship combining different entrepreneurial sustainability contributions in productive ways can generate innovations able to coordinate and even scale for sustainability transformations. So far, however, such cross-sector/cross-entrepreneurship does not happen in a systematic way. Here, not only collaborative entrepreneurship is needed but also innovative, entrepreneurial collaboration. Exploring this potential and how it could be tapped more effectively opens up interesting perspectives for sustainable and entrepreneurship theory and practice.

5 Conclusions and outlook

Given their underlying complexity and dynamics, sustainability problems challenge us all to collaborate for a deeper understanding and analysis as well as for jointly developing robust solutions that lead to real improvements. In spite of the necessity to collaborate for effective solutions, collaboration has so far received little attention in sustainable entrepreneurship research.

Collaboration constitutes a conceptual overlap between entrepreneurship and sustainability literatures. To achieve a broad sustainability transition needs various transformations on different levels of organisations, markets, society and governance. This, in turn, requires taking a broader perspective and to link entrepreneurial actors and processes.

Exploring what collaborative sustainable entrepreneurship could entail reveals that sustainability challenges increase the importance for entrepreneurial collaboration in three ways, for cross-actor participation within entrepreneurial processes, for coordinating across sustainability issues and between entrepreneurial solutions, and for cross-sector cooperation between different forms of entrepreneurship such as social entrepreneurship, sustainable entrepreneurship, and policy entrepreneurship.

In short, various forms of collaborative entrepreneurship can provide much needed contributions for sustainable development in general and for achieving the SDGs in particular. As our article has shown, however, academic scholarship is only beginning to understand this important overlap between entrepreneurship, sustainability, and trans-disciplinary collaboration. To help realise the potential of collaborative sustainability entrepreneurship in practice thus requires more cross-disciplinary research and innovative entrepreneurial collaboration in research.

References

Acs, Z. and Dana, L. (2001) 'Contrasting two models of wealth redistribution', *Small Business Economics*, Vol. 16, No. 2, pp.63–74.

Adams, R., Jeanrenaud, S., Bessant, J., Denyer, D. and Overy, P. (2016) 'Sustainability-oriented innovation. A systematic review', *International Journal of Management Reviews*, Vol. 18, No. 2, pp.180–205.

Ajzen, I. (1991) 'The theory of planned behavior', *Organizational Behavior and Human Decision Processes*, Vol. 50, No. 2, pp.179–211.

Allen, J.C. and Malin, S. (2008) 'Green entrepreneurship: a method for managing natural resources?', *Society and Natural Resources*, Vol. 21, pp.828–844.

Allen, P. (1999) 'Reweaving the food security safety net: mediating entitlement and entrepreneurship', *Agriculture and Human Values*, Vol. 16, No. 2, pp.117–129.

Alvord, S., Brown, L. and Letts, C. (2004) 'Social entrepreneurship and societal transformation: an exploratory study', *Journal of Applied Behavioral Science*, Vol. 40, No. 3, pp.260–282.

Boons, F. and Lüdeke-Freund, F. (2013) 'Business models for sustainable innovation: state-of-the-art and steps towards a research agenda', *Journal of Cleaner Production*, Vol. 45, pp.9–19.

Choi, D.Y. and Gray, E.R. (2008a) 'Socially responsible entrepreneurs: what do they do to create and build their companies?', *Business Horizon*, Vol. 51, No. 4, pp.341–352.

Choi, D.Y. and Gray, E.R. (2008b) 'The venture development processes of 'sustainable' entrepreneurs', *Management Research News*, Vol. 31, No. 8, pp.558–569.

Cohen, B. (2006) 'Sustainable value entrepreneurial ecosystems', *Business Strategy and the Environment*, Vol. 15, No. 1, pp.1–14.

Cohen, B. and Muñoz, P. (2016) *The Emergence of the Urban Entrepreneur: How the Growth of Cities and the Sharing Economy are Driving a New Breed of Innovators*, Praeger, Santa Barbara.

Cohen, B. and Winn, M.I. (2007) 'Market imperfections, opportunity and sustainable entrepreneurship', *Journal of Business Venturing*, Vol. 22, No. 1, pp.29–49.

Constanze, D. and Bonanno, A. (2000) 'Regulating the global fisheries: the World Wildlife Fund, Unilever, and the Marine Stewardship Council', *Agriculture and Human Values*, Vol. 17, No. 2, pp.125–139.

Cornwall, J. (1998) 'The entrepreneur as a building block', *Journal of Developmental Entrepreneurship*, Vol. 3, No 2, pp.141–148.

Dean, T.J. and McMullen, J.S. (2007) 'Toward a theory of sustainable entrepreneurship: reducing environmental degradation through entrepreneurial action', *Journal of Business Venturing*, Vol. 22, No. 1, pp.50–76.

Din, M. (2017) 'Students as mavericks for change: a model for introduction educational entrepreneurship training', *International Education and Research Journal*, Vol. 3, No. 2, pp.14–15.

Dixon, S.E. and Clifford, D. (2007) 'Ecopreneurship: a new approach to managing the triple bottom line', *Journal of Organizational Change Management*, Vol. 20, No. 3, pp326–345.

Drucker, P.F. (1986) *Innovation and Entrepreneurship*, Harper Business, New York.

Ernst, K. (2011) *Heart over Mind: An Empirical Analysis of Social Entrepreneurial Intention Formation on the Basis of the Theory of Planned Behaviour*, Unpublished dissertation, University Wuppertal.

Fellnhofer, K., Kraus, S. and Bouncken, R. (2014) 'Sustainable entrepreneurship: a current review of literature', *International Journal of Business Research*, Vol. 14, No. 3, pp.163–172.

Forster, F. and Grichnik, D. (2013) 'Why social entrepreneurs act: the intention formation of corporate volunteers', *Journal of Social Entrepreneurship*, Vol. 4, No. 2, pp.153–181.

Gapp, R. and Fisher, R. (2007) 'Developing an intrapreneur-led three-phase model of innovation', *International Journal of Entrepreneurial Behavior & Research*, Vol. 13, No. 6, pp.330–348.

Hall, J., Matos, S., Sheehan, L. and Silvestre, B. (2012) 'Entrepreneurship and innovation at the base of the pyramid: a recipe for inclusive growth or social exclusion?', *Journal of Management Studies*, Vol. 49, No. 4, pp.785–812.

Hall, J.K., Daneke, G.A. and Lenox, M.J. (2010) 'Sustainable development and entrepreneurship: past contributions and future directions', *Journal of Business Venturing*, Vol. 25, No. 5, pp.439–448.

Hart, S.L. and Milstein, M.B. (1999) 'Global sustainability and the creative destruction of industries', *Sloan Management Review*, Vol. 41, No. 1, pp.23–33.

Hayek, F.A. (1945) 'The use of knowledge in society', *The American Economic Review*, Vol. 35, No. 4, pp.519–530.

Hockerts, K. (2004) 'Entrepreneurial opportunity in social purpose business ventures', in Mair, J., Robinson, J. and Hockerts, K. (Eds.): *Social Entrepreneurship*, pp.142–154, Springer, Heidelberg.

Hockerts, K. (2015) 'A cognitive perspective on the business case for corporate sustainability', *Business Strategy and the Environment*, Vol. 24, No. 2, pp.102–122.

Hockerts, K. (2017) 'Determinants of social entrepreneurial intentions', *Entrepreneurship*, *Theory*, *and Practice*, Vol. 41, No. 1, pp.105–130.

Hockerts, K. and Wüstenhagen, R. (2010) 'Greening Goliaths versus emerging Davids: theorizing about the role of incumbents and new entrants in sustainable entrepreneurship', *Journal of Business Venturing*, Vol. 25, No. 5, pp.481–492.

Hollows, J. and Jones, S. (2010) ''At least he's doing something': moral entrepreneurship and individual responsibility in Jamie's Ministry of Food', *European Journal of Cultural Studies*, Vol. 13, No. 3, pp.307–322.

Hörisch, J., Freeman, E. and Schaltegger, S. (2014) 'Applying stakeholder theory in sustainability management: links, similarities, dissimilarities, and conceptual framework', *Organization & Environment*, Vol. 27, No. 4, pp.328–346.

Ikerd, J. (2011) 'Local food: revolution and reality', *Journal of Agricultural & Food Information*, Vol. 12, No. 1, pp.49–57.

Isenberg, D.J. (2011) *The Entrepreneurship Ecosystem Strategy as a New Paradigm For Economic Policy: Principles for Cultivating Entrepreneurship*, Institute of International and European Affairs, Dublin.

Jahn, T., Bergmann, M. and Keil, F. (2012) 'Transdisciplinarity: between mainstreaming and marginalization', *Ecological Economics*, Vol. 79, pp.1–10.

Jolink, A. and Niesten, E. (2015) 'Sustainable development and business models of entrepreneurs in the organic food industry', *Business Strategy and the Environment*, Vol. 24, No. 6, pp.386–401.

Kautonen, T., van Gelderen, M. and Fink, M. (2015) 'Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions', *Entrepreneurship Theory and Practice*, Vol. 39, No. 3, pp.655–674.

Kearins, K. and Collins, E. (2012) 'Making sense of ecopreneurs' decisions to sell up', *Business Strategy and the Environment*, Vol. 21, No. 2, pp.71–85.

Kent, D. and Dacin, M. (2013) 'Bankers at the gate: microfinance and the high cost of borrowed logics', *Journal of Business Venturing*, Vol. 28, No 6, pp.759–773.

Kets de Vries, M. (1977) 'The entrepreneurial personality: a person at the crossroads', *Journal of Management Studies*, Vol. 14, No. 1, pp.34–57.

Kidd, B. (2008) 'A new social movement: sport for development and peace', *Sport in Society*, Vol. 11, No. 4, pp.370–380.

Kirkwood, J. and Walton, S. (2010) 'What motivates ecopreneurs to start businesses?', *International Journal of Entrepreneurial Behavior & Research*, Vol. 16, No. 3, pp.204–228.

Kirzner, I. (1973) *Competition and Entrepreneurship*, University of Chicago Press, Chicago.

Klewitz, J. and Hansen, E.G. (2014) 'Sustainability-oriented innovation of SMEs: a systematic review', *Journal of Cleaner Production*, Vol. 65, pp.57–75.

Koe, W. and Majid, I. (2014) 'A model for predicting intention towards sustainable entrepreneurship', *International Journal of Information, Business and Management*, Vol. 6, No. 2, pp.256–269.

Koe, W., Omar, R. and Majid, I. (2014) 'Factors associated with propensity for sustainable entrepreneurship', *Procedia-Social and Behavioral Sciences*, Vol. 130, pp.65–74.

Krueger, N.F. (1993) 'The impact of prior entrepreneurial exposure on perceptions of new venture feasibility and desirability', *Entrepreneurship Theory and Practice*, Vol. 18, No. 1, pp.5–21.

Krueger, N.F., Reilly, M.D. and Carsrud, A.L. (2000) 'Competing models of entrepreneurial intentions', *Journal of Business Venturing*, Vol. 15, Nos. 5–6, pp.411–432.

Kuckertz, A. and Wagner, M. (2010) 'The influence of sustainability orientation on entrepreneurial intentions: investigating the role of business experience', *Journal of Business Venturing*, Vol. 25, No. 5, pp.524–539.

Lang, D., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P. and Moll, P. (2012) 'Transdisciplinary research in sustainability science: practice, principles, and challenges', *Sustainability Science*, Vol. 7, No. 1, pp.25–43.

Larson, A.L. (2000) 'Sustainable innovation through an entrepreneurship lens', *Business Strategy and the Environment*, Vol. 9, No. 5, p.304.

Leyden, D.P. and Link, A.N. (2013) 'Knowledge spillovers, collective entrepreneurship, and economic growth: the role of universities', *Small Business Economics*, Vol. 41, No. 4, pp.797–817.

Lordkipanidze, M., Brezet, H. and Backman, M. (2005) 'The entrepreneurship factor in sustainable tourism development', *Journal of Cleaner Production*, Vol. 13, No. 8, pp.787–798.

Lumpkin, G. and Dess, G. (1996) 'Clarifying the entrepreneurial orientation construct and linking it to performance', *Academy of Management Review*, Vol. 21, No. 1, pp.135–172.

Mair, J. and Noboa, E. (2006) 'Social entrepreneurship: how intentions to create a social venture get formed', in Mair, J., Robinson, J. and Hockerts, K. (Eds.): *Social Entrepreneurship*, pp.121–136, Palgrave MacMillan, New York.

Malach Pines, A., Lerner, M. and Schwartz, D. (2010) 'Gender differences in entrepreneurship: equality, diversity and inclusion in times of global crisis', *Equality*, *Diversity and Inclusion*. *An International Journal*, Vol. 29, No. 2, pp.186–198.

Marsden, T. and Smith, E. (2005) 'Ecological entrepreneurship: sustainable development in local communities through quality food production and local branding', *Geoforum*, Vol. 36, No. 4, pp.440–451.

Martin, R.L. and Osberg, S. (2007) 'Social entrepreneurship: the case for definition, *Stanford Social Innovation Review*, Vol. 5, No. 2, pp.28–39.

Mason, C. and Brown, R. (2014) *Entrepreneurial Ecosystems and Growth Oriented Entrepreneurship*, Final Report to OECD, Paris.

Miles, R., Miles, G. and Snow, C. (2005) *Collaborative Entrepreneurship: How Communities of Networked Firms use Continuous Innovation to Create Economic Wealth*, Stanford University Press, Stanford.

Mintrom, M. (1997) 'Policy entrepreneurs and the diffusion of innovation', American *Journal of Political Science*, Vol. 41, No. 3, pp.738–770.

Montgomery, M., Bartram, J. and Elimelech, M. (2009) 'Increasing functional sustainability of water and sanitation supplies in rural sub-Saharan Africa', *Environmental Engineering Science*, Vol. 26, No. 5, pp.1017–1023.

Montgomery, W., Dacin, P. and Dacin, M. (2012) 'Collective social entrepreneurship: collaboratively shaping social good', *Journal of Business Ethics*, Vol. 111, No. 3, pp.375–388.

Muñoz, P. and Cohen, B. (2017a) 'Towards a social-ecological understanding of sustainable venturing', *Journal of Business Venturing Insights*, Vol. 7, pp.1–8.

Muñoz, P. and Cohen, B. (2017b) 'Entrepreneurial narratives in sustainable venturing: beyond people, profit and planet', *Journal of Small Business Management* [online] http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1540-627X (accessed 10 November 2017).

Oborn, E., Barrett, M. and Exworthy, M. (2011) 'Policy entrepreneurship in the development of public sector strategy: the case of London health reform', *Public Administration*, Vol. 89, No. 2, pp.325–344.

Oham, C. and Macdonald, D. (2016) *Leading and Managing a Social Enterprise in Health and Social Care*, Community Training Partners, Stratford East, London.

Paech, N. (2007) 'Directional certainty in sustainability-oriented innovation management', in: Lehmann-Waffenschmidt, M. (Ed.): *Innovations towards Sustainability*, pp.121–139, Physica, Heidelberg.

Pepin, J. (2005) 'Venture capitalists and entrepreneurs become venture philanthropists', *International Journal of Nonprofit and Voluntary Sector Marketing*, Vol. 10, No 3, pp.165–173.

Pinchot III, G. (1988) *The Intrapreneur's Ten Commandments*, New Haven.

Pinkse, J. and Groot, K. (2015) 'Sustainable entrepreneurship and corporate political activity: overcoming market barriers in the clean energy sector', *Entrepreneurship Theory and Practice*, Vol. 39, No. 3, pp.633–654.

Ratten, V. (2014) 'Future research directions for collective entrepreneurship in developing countries: a small and medium-sized enterprise perspective', *Journal of Entrepreneurship and Small Business*, Vol. 22, No. 2, pp.266–274.

Richter, F.J. and Teramoto, Y. (1995) 'Interpreneurship: a new management concept from Japan', in Kumar, B.N. (Ed.): *Management and International Review*, pp.91–104, Springer, Wiesbaden.

Rimmer, M. (2014) *Tesla Motors: Intellectual Property, Open Innovation, and the Carbon Crisis*, The Australian National University College of Law, Canberra.

Rocha, H. and Miles, R. (2009) 'A model of collaborative entrepreneurship for a more humanistic management', *Journal of Business Ethics*, Vol. 88, No. 3, pp.445–462.

Rogers, E.M. (2010) *Diffusion of Innovations*, Free Press.

Sarasvathy, S.D. (2001) 'Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency', *Academy of Management Review*, Vol. 26, No. 2, pp.243–263.

Sarasvathy, S.D. (2008) '*Effectuation: Elements of Entrepreneurial Expertise*, Edward Elgar, Cheltenham, U.K.

Sarasvathy, S.D. and Dew, N. (2005) 'New market creation through transformation', *Journal of Evolutionary Economics*, Vol. 15, No. 5, pp.533–565.

Sarasvathy, S.D., Menon, A.R. and Kuechle, G. (2013) 'Failing firms and successful entrepreneurs: serial entrepreneurship as a temporal portfolio', *Small Business Economics*, Vol. 40, No. 2, pp.417–434.

Schaltegger, S. (2002) 'A framework for ecopreneurship: leading bioneers and environmental managers to ecopreneurship', *Greener Management International*, No. 38, pp.45–58.

Schaltegger, S. and Hansen, E.G. (2013) 'Industry transformation through sustainable entrepreneurship: examples in the apparel and energy industries', in McIntosh, M. (Ed.): *The Necessary Transition*, pp.182–197, Emerald, London.

Schaltegger, S. and Wagner, M. (2010) 'Sustainable entrepreneurship and sustainability innovation: Categories and interactions', *Business Strategy and the Environment*, Vol. 20, No. 4, pp.222–237.

Schaltegger, S., Beckmann, M. and Hansen, E. (2013) 'Transdisciplinarity in corporate sustainability: mapping the field', *Business Strategy and the Environment*, Vol. 22, No. 4, pp.219–229.

Schaltegger, S., Hörisch, J. and Freeman, E (2017) 'Business cases for sustainability: a stakeholder theory perspective', *Organization & Environment*, DOI: 10.1177/1086026617722882.

Schaltegger, S., Lüdeke-Freund, F. and Hansen, E. (2016) 'Business models for sustainability: a co-evolutionary analysis of sustainable entrepreneurship, innovation, and transformation', *Organization & Environment*, Vol. 29, No. 3, pp.264–289.

Schlange, L.E. (2006) 'Stakeholder identification in sustainability entrepreneurship', *Greener Management International*, Vol. 55, pp.13–32.

Schumpeter, J.A. (1939) *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process*, McGraw-Hill, New York.

Schumpeter, J.A. (1962/1934) *The Theory of Economic Development*, Oxford University Press, New York.

Seelos, C. and Mair, J. (2005) 'Social entrepreneurship: creating new business models to serve the poor', *Business Horizons*, Vol. 48, No. 3, pp.241–246.

Shane, S. (2004) *Academic Entrepreneurship: University Spinoffs and Wealth Creation*, MPG Books Publ., Bodmin.

Shane, S. and Venkataraman, S. (2000) 'The promise of entrepreneurship as a field of research', *Academy of Management Review*, Vol. 25, No. 1, pp.217–226.

Shepherd, D.A. and Patzelt, H. (2011) 'The new field of sustainable entrepreneurship: studying entrepreneurial action linking 'what is to be sustained' with 'what is to be developed'', *Entrepreneurship Theory and Practice*, Vol. 35, No. 1, pp.137–163.

Shepherd, D.A., Patzelt, H. and Baron, R.A. (2013) ''I care about nature, but…': disengaging values in assessing opportunities that cause harm', *Academy of Management Journal*, Vol. 56, No. 5, pp.1251–1273.

Smith, K. and Petersen, J. (2006) 'What is educational entrepreneurship?', in Hess, F. (Ed.): *Educational Entrepreneurship: Realities, Challenges, Possibilities*, Harvard Education Press, Boston.

Spencer, A., Kirchhoff, B. and While, C. (2008) 'Entrepreneurship, innovation, and wealth distribution: the essence of creative destruction', *International Small Business Journal: Researching Entrepreneurship*, Vol. 26, No. 1, pp.9–26.

Stevenson, H.H. and Gumpert, D.E. (1985) 'The heart of entrepreneurship', *Harvard Business Review*, Vol. 63, No. 2, pp.85–95.

Tambunan, T. (2009) 'Women entrepreneurship in Asian developing countries: their development and main constraints', *Journal of Development and Agriculture*, Vol. 1, No. 2, pp.27–40.

Tencati, A. and Zsolnai, L. (2009) 'The collaborative enterprise', *Journal of Business Ethics*, Vol. 85, No. 3, pp.367–376.

Tracey, P., Phillips, N. and Jarvis, O. (2011) 'Bridging institutional entrepreneurship and the creation of new organizational forms: a multilevel model', *Organization Science*, Vol. 22, No. 1, pp.60–80.

United Nations General Assembly (UN) (2015) *Transforming Our World: The 2030 Agenda for Sustainable Development*, Resolution adopted by the General Assembly, 25 September, A/RES/70/1, United Nations, New York.

Van de Ven, H. (1993) 'The development of an infrastructure for entrepreneurship', *Journal of Business Venturing*, Vol. 8, No. 3, pp.211–230.

Van Slyke, D.M. and Newman, H.K. (2006) 'Venture philanthropy and social entrepreneurship in community redevelopment', *Nonprofit Management and Leadership*, Vol. 16, No. 3, pp.345–368.

Wang, H., Alon, I. and Kimble, C. (2015) 'Dialogue in the dark: shedding light on the development of social enterprises in China', *Global Business and Organizational Excellence*, Vol. 34, No. 4, pp.60–69.

Weaver-Hightower, M. (2011) 'Why education researchers should take school food seriously', *Educational Researcher*, Vol. 40, No. 1, pp.15–21.

Wheeler, D., McKague, K., Thomson, J., Davies, R., Medalye, M. and Prada, M. (2005) 'Creating sustainable local enterprise networks', *MIT Sloan Management Review*, Vol. 47, No. 1, pp.33–40.

Whitman, J. (2011) 'Social entrepreneurship: an overview', in Bygrave, W. and Zacharakis, A. (Eds.): *Entrepreneurship*, pp.563–582, Wiley, Hoboken, NJ.

Wiek, A., Ness, B., Schweizer-Ries, P., Brand, F. and Farioli, F. (2012) 'From complex systems analysis to transformational change: a comparative appraisal of sustainability science projects', *Sustainability Science*, Vol. 7, No. 1, pp.5–24.

World Commission on Environment and Development (WCED) (1987) *Our Common Future*, Oxford University Press, Oxford.

Wüstenhagen, R. and Wuebker, R. (2011) *Handbook of Research on Energy Entrepreneurship*, Edward Elgar, Cheltenham.

York, J.G. and Venkataraman, S. (2010) 'The entrepreneur-environment nexus: uncertainty, innovation, and allocation', *Journal of Business Venturing*, Vol. 25, No. 5, pp.449–463.

Yunus, M. and Weber, K. (2007) '*Creating a World without Poverty: Social Business and the Future of Capitalism*, Public Affairs, New York, NY.

Zahra, S.A. and Nambisan, S. (2011) 'Entrepreneurship in global innovation ecosystems', *AMS Review*, Vol. 1 No. 1, pp.4–17.