

Chapter 1

Business Challenges in the Transition to Sustainability



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Abstract The first chapter of this book presents a brief history of Sustainable Development (SD) and takes a closer look at business and industry and their attitudes and actions towards sustainability regarding technological development, environmental issues and challenges for organizations. The goal of the chapter is to advocate for the growing need for competence building in sustainability amongst business leaders as well as societal stakeholders. It prepares the reader to understand how this can be done via the tools and strategies that are discussed in the following chapters of this book.

1.1 Introduction

Advancing the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda is a globally recognized aim. National governments and societies across the world are launching SDG-based strategies or aligning their existing policy plans and objectives with the SDGs. As the United Nations stated in their Preamble:

The 17 Sustainable Development Goals and 169 targets which we are announcing today demonstrate the scale and ambition of this new universal Agenda. (UN 2015).

In terms of business, the SDGs include, amongst others, an obligation for industry to adhere to in order to realize SD standards. The World Commission on Environment and Development also known as the Brundtland Commission (Brundtland 1987) coined the definition of SD, a predecessor of the SDGs, as:

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

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Besides emphasizing the needs of both present and future generations, SD is also concerned with meeting the triple bottom line – social, environmental and economic aspects – also referred to as *people, planet and profit*. The triple bottom line represents a dynamic balance that must be maintained between human activities, technologies, natural environmental capacities, human requirements, living standards, goals and values (Ehrenfeld 1994). Even if SD is considered a metafix by some authors (e.g. Lele 2018), the concept provides an agenda and direction for further global decision-making, research and development.

Both the SDGs and SD require expanding the scope of traditional business management and reporting, for example, to explicitly include social and environmental aspects in organizational reporting in addition to its economic performance and its products and services. Both the SDGs and SD have their roots in the environmental crisis of the late 1970s.

1.1.1 Historical Background

As factories materialized in increasing numbers (mainly in the United Kingdom) in the late 1800s, environmental impact on the surrounding land and air also increased. Smoke was released into the air and pollution belched into streams and lakes leading to acidification, fish-death and biodiversity degradation. With no laws in place to stop this, emissions quickly escalated.

In 1952, London's 'Great Smog' killed an estimated 12,000 people and gave rise to the Clean Air Act (1956) in an attempt to control domestic sources of air pollution. A subsequent Clean Air Act was passed in 1968. Regulating the minimum heights of chimneys, air pollution conferred with the motto 'Dilution is the solution to pollution'. It required chimney stacks in and near towns to be built up taller to push pollution away from inhabitants. Neither act considered reducing factory emissions or their role as significant air polluters (Shorthouse and Nicolle 2019).

Rachel Carson's book *Silent Spring*, published in 1961, Paul Ehrlich's *The Population Bomb* from 1968 and particularly, the Club of Rome's report '*Limits to Growth*' (Meadows et al. 1972) served as wakeup calls for a necessarily broader sustainability quest, expanding from earlier environmentalism perspectives largely concerned with protecting wild land (Keitsch 2018). Some authors also claim that the discourse on the environment was driven by the fact that the exhaustion of natural ecosystems had shown severe consequences not only for nature, but also for humans and society itself (Odum 1998). Changes in the natural environment placed the social environment under pressure to change. Environmental concerns were partly triggered by fears that economic growth might endanger the survival of the human race and the planet, expressed by authors such as Glick: "...if we continue our present practices, we will face a steady deterioration of the conditions under which we live" (Dubos et al. 1960).

In 1972, the United Nations Conference on the Human Environment Declaration (the Stockholm Declaration) recognized that: “In our time, man’s capability to transform his surroundings, if used wisely, can bring to all peoples the benefit of development and the opportunity to enhance the quality of life. Wrongly or heedlessly applied, the same power can do incalculable harm to human beings and human environment.” Furthermore, Article 3 stated: “To defend and improve the human environment for present and future generations has become an imperative goal for mankind.” This conference brought politicians’ attention to the rising problem of pollution, pesticides, and other issues faced on a global scale. It was one of the first times a political meeting had such an overwhelming number of citizens attend. Disastrous events such as the Minamata Disaster in 1950, in which 1785 people died from methylmercury leaking into waterways, and the impact of Agent Orange on humans in Vietnam, were brought to the table.

Despite various policies and acts formed after the 1970s, their implementation in different societal sectors halted, and hence lacked rapid progress. In the 1980s, climate change was introduced to the growing list of global environmental challenges, later summarized in the Kyoto protocol (United Nations 1998). In addition, the discovery of the depletion of the ozone layer over Antarctica led to an increase in research on the impact of greenhouse gas emissions and chemicals on the atmosphere and ozone layer. As a result, ozone depleting chemicals were either regulated or banned by international laws by the late 1980s (Montreal Protocol 1987).

In the last decade of the twentieth century, increasing concern about the way in which human activities affect natural systems evolved amongst various stakeholders across society. Although there was some dispute over the rate of change, most scientists, researchers and decision-makers accepted that the challenges of the new millennium comprised the loss of biodiversity, thinning of stratospheric ozone, climate change and the collapse of natural resource stocks. The Brundtland report was presented at the UN Rio-Summit in 1992. It became a core document for decades to come (United Nations 2007).

SD topics and policies were further debated at the RIO + 10 summit in Johannesburg in 2002 (World Summit on Sustainable Development 2002) and the RIO + 20 summit in Rio de Janeiro in 2012. The summit in Johannesburg gathered hundreds of Heads of State and government and tens of thousands of government representatives and non-governmental organizations. The ‘Rio + 20 summit’, officially called the United Nations Conference on Sustainable Development (UNCSD), was attended by multinational companies and world leaders, with countries less well represented (United Nations 2012). The report ‘The Future We Want’ sets out broad sustainability topics such as Poverty Eradication, Food Security and Sustainable Agriculture, Energy, Sustainable Transport, Sustainable Cities, Health and Population, and Promoting Full and Productive Employment, clearly pointing towards the Sustainable Development Goals (European Environment Agency 2012).

According to some authors (Van Dieren 1995; Kassel et al. 2018; Keitsch 2021), SD also contributed to a change in mindset of societal actors from focusing on *problems*, to an interest in feasible, accessible and flexible *solutions* for SD. To ensure consensus on the need for progress, collaboration among stakeholders is essential,

hereunder including governmental agencies, industry, non-governmental organizations (NGOs), research and academic institutions, individual citizens such as neighbours, voters, employers, investors, consumers and so on.

Moreover, to avoid dramatic incidents, the push towards integration of economic, social and ecological issues also requires the integration of all other relevant stakeholders. This became even clearer around the millennium and was brought to attention and reflected in the United Nations Millennium Development Goals, which guided sustainable development actions from 2000 to 2015 (United Nations 2000). Al Gore's 2006 book and documentary, *An Inconvenient Truth*, brought attention to extreme weather problems caused by global warming and simultaneously pinpointed the risk of social disturbances, injustice and wars caused by environmental disasters.

In 2015, 193 countries agreed to adopt the SDGs for the period 2015–2030. They are meant to encourage the international community to move towards a global sustainable future over the next few decades, and are part of the 2030 Agenda, officially known as “Transforming our World: the 2030 Agenda for Sustainable Development”, agreed at the UN Sustainable Development Summit in September 2015 (United Nations 2015). The SDG framework is comprised of 17 goals and 169 targets that succeed the eight Millennium Development Goals. The SDGs set a very ambitious range of goals relevant for regional, national and global issues. Human development across triple bottom line dimensions (social, economic, and environmental) is central to the set of goals. Advancing the SDGs of the UN 2030 Agenda is warranted globally, and national governments all over the world continue to launch SDG-based development strategies, or align their existing policy plans with the proposed goals. The aim of these SDGs is, amongst others, to end poverty, fight inequality, protect biodiversity on land and in the oceans and urge efforts related to slowing down climate change.

In the preceding two decades, sustainability challenges have transformed society and actors such as industries and businesses. They have influenced the development of solutions and guided competitiveness toward solving these ecological and social business challenges. It is crucial to acknowledge the history and development of this movement, not only for further education, knowledge sharing and inspiration, but also to understand that all endeavours to move the world towards sustainability are part of a long line of activism. The global ecology movement has reached every corner of the world, and while sustainable activities contribute to edging the planet back from the brink of environmental disaster, ecological challenges grow ever more daunting (Weyler 2018).

As this brief introduction illustrates, the concept of SD has not only undergone huge transformations since its first definition by the Brundtland commission in 1987, but has also become much more specific in many areas. SD has been continually revised, addressing areas of knowledge identified and innovation taking place as new challenges arise.

The following section takes a closer look at business and industry and their attitudes and actions towards sustainability.

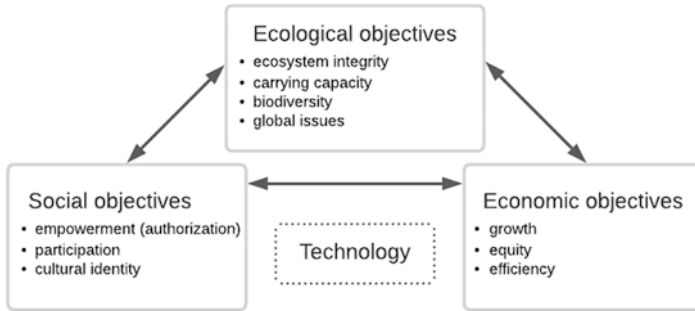


Fig. 1.1 Interrelationships between ecological, social and economic objectives for sustainable technology development. (Fet 1997)

1.1.2 *Technology Development and Sustainability*

The concept of sustainability now differs from former views of environmental value and the way in which social strategies were designed. Amid several assumptions, former frontier economists assumed that the earth was limitless in its capacity to support human society, that the future is created through price systems based on a free market and that technology is good and the solution to all problems (Ehrenfeld 1994).

In a narrow economic definition, sustainability comprises the maintenance of human-made capital (Bartelemus 2002). Social sustainability includes human rights, moral and social justice and natural capital stock of environmentally available assets such as soil, the atmosphere, forests, water and wetlands. To avoid compartmentalization, in which each societal actor pursues their own idiosyncratic sustainability strategy, different domains should be encouraged to collaborate and support each other. For example, technology must be designed to adjust to ecological, social and economic objectives. An important challenge for companies worldwide is the development of sustainable technologies that fit in with an integrated system of ecology, economy and social needs in a long-term perspective (Keitsch 2021). Technology development in relation to triple bottom line objectives is illustrated in Fig. 1.1. Social objectives include empowerment, participation and cultural identity, while economic objectives address equity and efficiency to support growth. Ecological objectives must secure ecosystem integrity and support the earth's carrying capacity and biodiversity.

1.1.3 *Categorising Environmental Issues*

There are many ways to categorize the environmental issues behind ecological objectives. According to OECD, they were grouped into four main categories of impacts (Gouzee et al., 1995) caused by (1) use of natural resources; (2) flows of

pollutants and emissions; (3) reshaping of environment and changes of ecosystems, and (4) effects on human welfare caused by the condition of the environment. The type of impact can be identified based on the exchange of particular substances between technology and the environment (Fet 1997). The use of raw materials involves the extraction of substances from the environment, while emissions are the release of substances into the environment. Both extraction and emissions play a role across environmental issues. The most prominent environmental issues, or impact categories, are loss of biodiversity, climate change, depletion of the ozone layer, acidification of soils and lakes, eutrophication of water bodies, toxification of soils, water bodies and ecosystems, and accumulation of solid waste in nature. These categories can be further classified according to their global, regional and local impacts, as here exemplified by climate change, acidification and air quality.

1.1.4 Challenges for Business

Industrial companies are increasingly concerned about the impacts of their processes, products and services, all while searching for balance between profitability and sustainability. Without a reasonable degree of profitability, a private company cannot continue to function. This applies to both large and smaller companies. Small and medium sized companies (SMEs) are less robust financially and will in many cases take a reactive, rather than a proactive approach to addressing environmental challenges. The question, however, surrounds how environmental improvement measures will benefit the company. Historically, there has been a general notion that sustainability measures implicate higher costs which cannot be justified from the perspective of cashflow. In many cases this was probably correct and relatively few companies employed a proactive attitude. However, with growing need and pressure on a global scale, industrial companies increasingly use environmental performance as an element in their marketing efforts to meet their customers' demands and in an attempt to give their products added value.

Long term competitiveness on the market seems to be the most important motivation. Businesses increasingly request information and seek out tools to understand the environmental aspects and related impacts from their processes, products and services. Rapid green transition influences businesses' competitiveness based upon changes in markets, in technologies and in authorities' frameworks. Changing markets are driven by increased environmentally conscious demand and willingness to pay for environmental benefits, from individual consumers, to purchases by private businesses and via public sector procurement. A changing technological landscape, often driven by adaptations in authorities' frameworks to place penalties, taxes and fees on pollution, supports the development and implementation of new and emerging technologies.

Despite the drivers for change, most industrial companies do not have a comprehensive sustainability policy that covers all of their activities. In most cases, they only react when a business advantage is apparent or when market pressure,

legislation or international treaties force them to react. Most companies also tend to have a strategic planning perspective for the short-term, for example 3–5 years. What happens 20–30 years later has less influence on their decisions now unless indisputable consequences can be amply demonstrated.

This might also hamper a critical re-thinking of industrial practices from industry until pressure for change is much more compelling. Such pressure will include economic incentives and social inputs into industrial decision making. Furthermore, mechanisms will have to be created to foster the goal of balancing industrial activity, the environment and equity concerns. This can be achieved if companies adopt system-oriented strategies to satisfy a growing demand for *green* products.

System-oriented strategies and holistic life cycle perspectives can be designed from both top-down and bottom-up approaches. A bottom-up approach often starts with an overview and understanding of the most significant aspects of sustainability connected to production systems and moreover to products and their material value-chains. Such strategies therefore depart from the possibility of increased resource efficiency, reduction of wastes and emissions at the production site and across the various parts and stages of the product value chain. Strategies are frequently built on principles of *good housekeeping* and implemented through internal control systems which are also a mechanism for ensuring rules and regulations are met. A top-down approach, on the other hand, often results from overarching challenges, such as the company's contribution to reducing the impact on climate for the sector. Companies are confronted with a wide range of demands through stricter regulations, standards and legislations. Business strategies are often developed based on a vision of achieving goals according to those presumed most important for the company. Procedures, regarding internal and external performance on different systems levels, will then be developed in order to implement those strategies.

Regardless of whether the approach is top-down or bottom-up, a set of guiding principles can be helpful. The purpose of the CapSEM Model presented in Chap. 2 is to provide guidance to companies about the availability of actual tools to analyse the environmental aspects and impacts of their processes, products and services, and to further theory on how to build competence and understanding surrounding the application of these tools in their stepwise transition towards sustainability.

1.2 Conclusion

This chapter started by tracing the history of SD, and concludes with an emphasis on the growing need for sustainability competence building in the business sector and for their stakeholders and other societal actors. The tools presented in the following chapters are provided to both inspire further knowledge-based development and create opportunities based on analyses and raised ambition, and to further support and facilitate the implementation of more sustainable solutions. The content is not only well-grounded in theory, but also oriented towards practical application.

References

- Bartelmus P (2002) Dematerialization and capital maintenance: two sides of the sustainability coin. Wuppertal papers, no. 120, Wuppertal Institut für Klima, Umwelt, Energie, Wuppertal
- Brundtland GH (1987) Our common future: report of the World Commission on environment and development. World Commission on Environment and Development
- Carson R (1961) *Silent spring*. Houghton Mifflin, Boston
- Dubos R, Cole LC, Jacobs J, Carter LC, Temko A, Bowen W, Wylie P (eds) (1960) *The environmental crisis*. United States Information Service, Washington, DC
- Ehrenfeld JR (1994) Industrial ecology: a strategic framework for product policy and other sustainable practices. In: *Green goods: the second international conference and workshop on product oriented policy*, Stockholm, September 1994
- European Environment Agency (2012) The future we want –declaration of the UN conference on sustainable development, Rio. Available via <https://www.eea.europa.eu/policy-documents/the-future-we-want-2013declaration>. Accessed 20 Jan 2022
- Fet AM (1997) *Systems engineering methods and environmental life cycle performance within ship industry*. Dissertation, Norwegian University of Science and Technology
- Gore A (2006) *An inconvenient truth: the planetary emergency of global warming and what we can do about it*. Rodale, New York
- Gouzee N, Mazijn B, Billharz S (1995) Indicators of sustainable development for decision-making. Federal Planning Office of Belgium, Ghent
- Kassel K, Rimanoczy I, Mitchell S (2018) A sustainability mindset model for management education. In: Kassel K, Rimanoczy I, Mitchell S (eds) *Developing a sustainability mindset in management education*. Routledge, London
- Keitsch M (2018) Structuring ethical interpretations of the sustainable development goals—concepts, implications and progress. *Sustainability* 10(3):829. <https://doi.org/10.3390/su10030829>
- Keitsch M (2021) Transdisciplinary collaboration and ethics. In: Keitsch M, Vermeulen W (eds) *Transdisciplinarity for sustainability*. Routledge, London, pp 53–74
- Lélé SM (2018) Sustainable development: a critical review. *World Dev* 19(6):607–621. [https://doi.org/10.1016/0305-750X\(91\)90197-P](https://doi.org/10.1016/0305-750X(91)90197-P)
- Meadows DH, Meadows DL, Randers J, Behrens WW III (1972) *The limits to growth-Club of Rome*. Universe Books, New York
- Montreal Protocol (1987) The Montreal protocol on substances that deplete the ozone layer. Available via <https://www.state.gov/key-topics-office-of-environmental-quality-and-transboundary-issues/the-montreal-protocol-on-substances-that-deplete-the-ozone-layer/>. Accessed 13 Dec 2021
- Odum EP (1998) *Ecology: a bridge between science and society*. Sinauer Associates Publishers, Sunderland
- Shorthouse R, Nicolle W (2019) *Emission impossible?* Bright Blue Campaign, London. Available via [Emission_Impossible_Final.pdf](https://www.brightblue.org.uk/Emission_Impossible_Final.pdf) ([brightblue.org.uk](https://www.brightblue.org.uk)). Accessed 20 Jan 2022
- United Nations (1972) Stockholm declaration on the human environment. In: Report of the United Nations conference on the human environment, UN Doc.A/CONF.48/14, at 2 and Corr.1
- United Nations (1998) Kyoto protocol to the United Nations framework convention on climate change. United Nations
- United Nations (2000) United Nations millennium declaration, 18 September 2000. <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N00/559/51/PDF/N0055951.pdf?OpenElement>. Accessed 26 Sept 2022
- United Nations (2002) World Summit on Sustainable Development. (Chapter III, section 14). <https://www.un.org/en/conferences/environment/johannesburg2002>. Accessed 20 Jan 2022
- United Nations (2007) Framing sustainable development the Brundtland report – 20 years on. Available online: http://www.un.org/esa/sustdev/csd/csd15/media/backgrounder_brundtland.pdf. Accessed 20 Jan 2022

- United Nations (2012) United Nations conference on sustainable development, Rio+20. United Nations Conference on Sustainable Development, Rio+20 ∴ Sustainable Development Knowledge Platform. Accessed 20 Jan 2022
- United Nations (2015) Transforming our world: the 2030 agenda for sustainable development. United Nations, New York. Transforming our world: the 2030 Agenda for Sustainable Development | Department of Economic and Social Affairs (un.org). Accessed 20 Jan 2022
- Van Dieren W (ed) (1995) Taking nature into account: a report to the Club of Rome: toward a sustainable national income. Springer, New York
- Weyler R. (2018) A brief history of environmentalism. Greenpeace International. Available via: A Brief History of Environmentalism - Greenpeace International. Accessed 20 Jan 2022

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