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Jurgis Kazimieras Staniškis · Eglė Staniškienė · Živilė Stankevičiūtė · Asta Daunorienė · Joana Ramanauskaitė

Transformation of Business Organization Towards Sustainability

Systems Approach

Springer

World Sustainability Series

Due to its scope and nature, sustainable development is a matter which is very interdisciplinary, and draws from knowledge and inputs from the social sciences and environmental sciences on the one hand, but also from physical sciences and arts on the other. As such, there is a perceived need to foster integrative approaches, whereby the combination of inputs from various fields may contribute to a better understanding of what sustainability is, and means to people. But despite the need for and the relevance of integrative approaches towards sustainable development, there is a paucity of literature which address matters related to sustainability in an integrated way.

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Jurgis Kazimieras Staniškis
Kaunas University of Technology
Kaunas, Lithuania

Živilė Stankevičiūtė
School of Economics and Business
Kaunas University of Technology
Kaunas, Lithuania

Joana Ramanauskaitė
School of Economics and Business
Kaunas University of Technology
Kaunas, Lithuania

Eglė Staniškienė
School of Economics and Business
Kaunas University of Technology
Kaunas, Lithuania

Asta Daunorienė
School of Economics and Business
Kaunas University of Technology
Kaunas, Lithuania

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Preface

When all the trees have been cut down, when all the animals have been hunted, when all the waters are polluted, when all the air is unsafe to breathe, only then will you discover you cannot eat money.—Cree Indian Prophesy

We have entered a new era where business, technologies, communities, and even pandemic diseases cross borders with unprecedented speed and intensity. The UN Millennium Declaration and its associated Millennium Development Goals have guided the global development goals through the first 15 years of the new century. In pursuit of the Millennium Development Goals, the global community achieved many successes, but also fell short in several ways as it learned important lessons about the opportunity of co-benefits and the inevitability of trade-offs and tough choices. In September, the United Nations Member States decided jointly on a global project—2030 Agenda—in order to shape our common future in a new, better, and more intentional way. Entitled "Transforming our World," this project reflects the global community's high expectations of finally reversing the destruction of our natural and social habitats, and achieving a more balanced and equitable pathway towards the well-being of all. Therefore, not only the Goals and targets, but also interactions among them, are brought into focus in the 2030 Agenda.

However, despite the initial efforts, the world is not on track to achieving most of the 169 targets that comprise the Goals. Limited success in progress towards the Goals raises strong concerns and sounds the alarm for the international community. Worrying is the fact that recent trends along several dimensions with cross-cutting impacts along the entire 2030 Agenda are not even moving into the right direction. Four in particular fall into that category: rising inequalities, climate change, biodiversity loss, and increasing amounts of waste from human activities that are overwhelming the capacities to process them. Thus, advancing the sustainable development must involve an urgent and intentional transformation of socio-environmental–economic systems, differentiated across countries but also adding up to the desired regional and global outcomes to ensure human well-being, social health, and limited environmental impact.

Before leaving office, former Secretary-General of the UN Ban Ki-moon appointed an Independent Group of Scientists (IGS) comprising 15 experts to draft

the Global Sustainable Development Report (GSDR). The Report is a key component of the mechanism to follow up and review progress on the recently agreed 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs). It seeks to strengthen the science-policy interface and provide a strong evidence-based instrument to support policymakers in promoting poverty eradication and sustainable development. The document is intended to provide guidance from a scientific perspective that supports the implementation of the Sustainable Development Goals and the 2030 Agenda in ways that integrate economic, environmental, and social dimensions. It is available for a wide range of stakeholders, including businesses, civil society, and the public. In the Report, the experts argue that the value and transformative potential of the 2030 Agenda is more than the sum of its 17 SDGs and 169 indicators. It is not only a unique normative compass; it also represents a vision of how natural resources could be best shared for the well-being of the 9 billion people who will soon populate this Earth. The assessment is based on a total of 65 global assessments comprising the United Nations flagship reports and international scientific assessments, as well as 112 scientific articles published since 2015 with explicit reference to the Sustainable Development Goals. Not all pathways and transformations towards achieving any given goal or target in the 2030 Agenda are equivalent in terms of their implications for the others. The report presents a global system model comprising six major transformations—human well-being and capabilities, sustainable and just economies, sustainable food systems and healthy nutrition, energy decarbonisation with universal access, urban and peri-urban development, and global commons. The selected transformations are critical if the sustainable development goals are to be met by 2030 in ways that will ensure sustainability for both current and future generations. At the same time, means and levers of transformations include governance, consumption and production (including financing), individual and collective action, and society and technology. When we think about the kinds of changes that will be required for the development towards sustainability, it is tempting to focus on the practical issues like financial regulation, taxation, or reduction of carbon intensity. Unfortunately, much more needs to happen, and quite quickly, to bring the required transformative changes about. The thermodynamics makes it clear that humans must find ways to balance the economic subsystem with the Earth's evolutionary and morphological processes, or the planet will use its own mechanisms to restore the balance. Systems analysis applied at the level of organisations, cities, and regional governance buys us time until, among other things, national governments catch up. At any level, it is only a tool to clarify the consequences of our actions, identify our options, and extend our foresight a bit (IGS, 2019).

The world is now closely interconnected by flows of goods, capital, people, and information. These flows, on the one hand, produce some benefits; however, on the other hand, they can also create negative impacts, for example, deepening inequalities, unfair competition, resource depletion, environmental pollution, and destruction.

The subject matter of economics should be the economy—which involves money, work, technology, international trade, taxes, and other things that have to do with the

ways in which we produce goods and services, distribute the incomes generated in the process, and consume the things thus produced.

We must make sure our economic analysis is structured in way that allows us to access the risk of such magnitude. All too often, economists are tempted to force everything into a simplistic cost-benefit analysis in which changes are marginal and all relevant effects can be described in terms of a single common denominator such as money. When someone has a hammer, every problem looks like a nail. For all these reasons, a policy analysis must begin with the science of sustainability, including climate change as one of the most important goals. It must examine where we may be going under different assumptions about policy. Worryingly, some plausible assumptions on current intentions suggest we are headed in a very dangerous direction (Stern 2016).

Current development patterns (even those touted as "sustainable") disrupt the social system and ecosystem relations rather than ensuring that the natural resource use by local communities meets their basic needs at a level of comfort that is satisfactory as assessed by those same communities. What is needed is not a common future but the future as commons (Banerjee 2003). Sustainability demands a discontinuous leap from the existing basis of cultural action. Transformation is a very powerful concept, because it denotes a process in which reality in front of us changes its form in an abrupt, discontinuous way.

Current concern about unsustainability has arisen from the observation that both natural and socio-economic systems are losing resilience that is the ability to cope with perturbations created by human activities without the appearance of fundamental, qualitative changes in the functions of these systems. There are great opportunities in the fact that the transformation to the sustainable development based on low-carbon economy coincides with the coming decade of radical structural transformation of the world. If the structural transformation is done well from the point of resource efficiency, responsible consumption and sustainable production, waste and pollution, liveable cities, inequality and poverty, and care of forests and grasslands, it strongly reduces the emissions.

The present book strives to address this issue by adopting a systematic approach to the Sustainable Development Goals, informed by the knowledge of the interactions among them. In this increasingly globalised and hyper-connected world, one goal can lead to unintended consequences for the implementation of other goals, i.e. the chances of progress on achievements in a specific country/region of the world will depend on interventions made in other sectors in distant places. Achieving transformation—a profound and intentional departure from business as usual—will mean carefully taking into account the interactions between the goals and targets.

At the heart of this book is a fundamental belief that the "purpose" of the economic system is to improve the well-being for all within the limits of what the planet can sustain—to produce good lives that do not cost the Earth. The book provides a logical way that links local scale production and service activities to systemic changes in macro-level paradigms. The role of different kinds of associated barriers as well as the complexity and uncertainty of transformations are highlighted. A strong focus is placed on the opportunities and barriers to changing the production-consumption

system, driving the environmental degradation. The financial reform should also reorient the investments into incremental and structural innovations towards mitigating or adapting sustainability problems. This book deals with the ways the elaborated system model could be used to search for policy-relevant solutions transforming the society towards sustainability on a global, regional, or country level. While the book as a product focuses on producing knowledge for transformations to sustainable development, IGS views the GSDR also as a process that can advance the collaborations between science, policy, and society.

Sustainability science in this book is understood according to the definition of Sustainability Science Programme at Harvard University: "Sustainability science is problem-driven transdisciplinary scholarship that seeks to facilitate the design, implementation, and evaluation of effective interventions that foster shared prosperity and reduced poverty while protecting environment. It is defined by the problems it addresses rather than the disciplines it employs. It thus draws as needed from multiple disciplines of the natural, social, medical and engineering sciences, from the professions, and from the knowledge of practice" (Harvard Kennedy School 2008).

The book consists of two parts. Part I, which comprises three chapters, mainly deals with sustainability issues at the production level. In Chaps. 1 and 2, the development of methods, mathematical presentation, and systems for unsustainability reduction in industrial organisations are presented. The key element for that is preventive incremental innovations, based on the concept of resource-efficient and cleaner production. An advanced system for the generation, financing, and implementation of innovations is discussed in the context that reduction of unsustainability does not lead to sustainable development as such. Broad discussions on the role and future of high education and sustainability science in transdisciplinary approach and its implementation in practice are presented in Chap. 2. Chapter 3 mainly relates to the sustainable development issue on the regional level. The system for transformations generation and control, comprising feedforward and feedback loops and based on transformation model, is elaborated. The presented transformation model was developed by the UN Independent Group of Scientists and presented at the UN General Assembly as a Global Sustainable Development Report "The Future is Now: Science for Achieving Sustainable Development" in September, 2019. Detailed discussions on different socio-economic systems, approaches and possible transformations, different pathways for their implementation in developed and developing economies are provided.

Part II comprises two chapters and mainly deals with obstacles and drivers to transitions of organisations towards sustainability. In Chap. 4, we provide theoretical insights on organisational transitions towards Corporate Social Responsibility (CSR), reviewing the literature about the historical evolution and concept of CSR, stakeholder theory and its application to CSR, the stakeholders' role in sustainability transitions, and obstacles and drivers of organisations moving towards CSR transitions. Chapter 5 is mainly intended for empirical insights on obstacles and drivers of CSR-committed organisations to sustainability transitions. In this chapter, we present the methodological and empirical part of the conducted studies: the research

context, the overview of quantitative research results, and the results of our interviews conducted on a sample of Lithuanian organisations. Finally, we discuss our results from the East European economy in transition.

The key message of the book is that we have to be open stating that future problems cannot be solved within the traditional paradigm of economic growth and reliance on technology and by specific policies intended to attenuate the most unethical behaviour and nudge the consumers, firms, and workers in the "correct" direction, i.e. only calling upon people to behave "right" within "wrong" structures.

Kaunas, Lithuania Jurgis Kazimieras Staniškis

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This monograph is the product of a group of scientists attempting to deeper understand the type of transformations towards sustainability that should be applied globally and on the level of business organisation to make the world more fair and decent while preserving a beautiful and liveable Earth. Concerning the global problems on economical, environmental and social development, I had a unique possibility to join the United Nations Independent Group of Scientists for Global Sustainable Development Reporting. In the personal letter on 30 December 2016, the UN General Secretary Ban Ki Moon wrote: "I have the pleasure to invite you to serve on the 15-member independent group of scientists selected to draft the quadrennial Global Sustainable Report.

In July 2016, the United Nations Member States decided that a Global Sustainable Report would be produced every four years, to inform on sustainable development when it meets high-level political forum under the auspices of the United Nations Assembly to review the progress made on the 2030 Agenda for Sustainable Development and the Sustainable Development Goals. The Report will strengthen the science-policy interface and provide a strong evidence-based instrument to support policymakers in promoting poverty eradication and sustainable development.

Following an extensive and open selection process, I have selected 15 eminent scientists to be invited to serve on independent group in their personal capacity."

I have to confess that my work in such a transdisciplinary group of highly skilled scientists was the most exiting period in my scientific career. I deeply appreciate the Group's enthusiasm, kindness, dedication, and professional contribution and would like to thank each personally: Peter Messerli (Switzerland), Endah Murniningtyas (Indonesia), Parfait Eloundou-Enyegue (Cameroon), Ernest G. Foli (Ghana), Eeva Furman (Finland), Amanda Glassman (USA), Gonzalo Hernandez Licona (Mexico), Eun Mee Kim (Republic of Korea), Wolfgang Lutz (Austria), Jean Paul Moatti (France), Katherine Richardson (Denmark), Muhammad Saidam (Jordan), David Smith (Jamaica), and Jean-Pascal van Ypersele (Belgium).

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On behalf of authors Jurgis Kazimieras Staniškis

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About the Authors

Jurgis Kazimieras Staniškis full member of the Lithuanian Academy of Sciences, professor—emeritus at Kaunas University of Technology, Lithuania, member of the United Nations Independent Group of Scientists for Global Sustainable Development Reporting.

J. K. Staniškis deals with the development of methods and tools based on systems theory for sustainable economy and sustainable industrial development, for instance, resource-efficient and cleaner production, systems for incremental preventive innovations generation, financing and implementation, and systems for transformations of global development towards sustainability. He is a manager and the main expert for more than 80 scientific and implementation international and national projects, establisher of the new transdisciplinary M.Sc. programme "Cleaner production and environmental management" and Ph.D. programme "Environmental engineering."

As an UNIDO/UNEP/OECD expert on unsustainability reduction in companies, J.K. Staniškis participated in the projects/missions in Tanzania, Zimbabwe, Uganda, Vietnam, China, Russia, Ukraine, Macedonia, Albania, Kyrgyzstan, Kazakhstan, Armenia, Azerbaijan, Guatemala, Nicaragua, Peru, etc. As a member of the UN Independent Group of Scientists, he is one of the authors or the Report "The Future is Now—Science for Achieving Sustainable Development" (2019).

Awards: National Science Awards (1979, 1988, 2004), His Excellence the President Dr. Valdas Adamkus Award (2005), the Baltic Sea Award (2010), the Cross of Officer of the Order for Merits to Lithuania (2009).

Eglė Staniškienė a professor at the Sustainable Management Research Group, School of Economics and Business, Kaunas University of Technology (KTU), Lithuania, Ph.D. in Social Sciences. Research interests include sustainable development, corporate social responsibility, responsible consumption and sustainable production, employee well-being, quality system management, and interdisciplinary research. Currently, E. Staniškienė is a member of the expert council of the Lithuanian Responsible Business Association (LAVA). She has published more than 60 scientific publications, participated in more than 20 national and international projects. E. Staniškienė is an expert of the United Nations Economic and Social Council (ECOSOC), a KTU representative in the international COPERNICUS alliance, a member of European Group for Organisational Studies (EGOS), International Sustainable Development Research Society (ISDRS), Academy of Management (AOM), and a European Member of the Academy of Management (EURAM). She uses and develops her scientific competence in the study process and in cooperation with business and public sector organisations. E. Staniškienė teaches the modules of Sustainable Development, Quality Management, Quality and Sustainable Development Management, Circular Economy, and others.

Živilė Stankevičiūtė Ph.D. in Management, is an Associated Professor at the Sustainable Management Research Group, School of Economics and Business, Kaunas University of Technology, Lithuania. Her doctoral dissertation on Sustainable Human Resource Management has been recognised internationally: she received the Baltic University Programme Annual Award for the Best Ph.D. defended in 2015. Her research interests include Sustainable Human Resource Management, Employee Well-being, Digital Transformations, Corporate Social Responsibility, and Sustainable Development. Ž. Stankevičiūtė is a member of the National Expert Council for sustainable development goals at the Lithuanian Responsible Business Association. Lecturing includes courses on Sustainable Development, Employee Performance Management, and Human Analytics.

Asta Daunorienė is an Associated Professor of Quality and Value Chain Management at Kaunas University School of Economics and Business, and a senior researcher at the Sustainable Management Research Group at School of Economics and Business, Kaunas University of Technology, Lithuania. Asta has completed her Ph.D. in the field of Economics at Kaunas University of Technology. Her research interest lies in the area of quality management, sustainable value and supply chain management, and new business models' development. She has actively collaborated with researchers in other disciplines of pedagogy and information technology. Asta currently serves on the ECIU learning and teaching expert group. A. Daunorienė has been involved in the expert activities in Ministry of Education, Science and Sport, contributing her skills to the strategy development for teachers' professional development and study quality improvement. She has comprehensive experience in quality management systems consulting.

Joana Ramanauskaitė is a Ph.D. candidate at the Sustainable Management Research Group at Kaunas University of Technology, Lithuania. She is interested in corporate sustainability, sustainable transitions, and their tensions. She is also a member of the Sustainability Transitions Research Network (STRN). Joana teaches the courses of Sustainable Development and Quality Management. She has been participating in the development of the interdisciplinary course of Sustainable Development for first-year bachelor students at KTU since 2019.

Abbreviations and Acronyms

APINI	Institute of Environmental Engineering at KTU
CSR	Corporate Social Responsibility
ESD	Education for Sustainable Development
GSDR	Global Sustainable Development Report
ICT	Information and Communications Technology
IGES	Institute for Global Environmental Strategies
IGS	Independent Group of Scientists
KTU	Kaunas University of Technology
MDGs	Millennium Development Goals
nef	New Economic Forum
ODA	Official Development Assistance
SCP	Sustainable Consumption and Production
SD	Sustainable Development
SDGs	Sustainable Development Goals
SROI	Social Return on Investment
UN	United Nations
UN-DESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
WEEE	Waste from Electrical and Electronic Equipment
WHO	World Health Organisation

Part I
Application of the Systems Theory for the Development of Measures Driving Business Organisations Towards Sustainability

Business and entrepreneurship based on inner awareness of the self, and directed to the natural and human environments; on technology design and implementation that meets people's material and non-material needs rather than just the profit motive; on technological change that creates the conditions for human inner growth and development; and on governance and business management instruments that benefit all people.

—Alfredo Sfeir-Younis, Chilean economist

Chapter 1
Sustainability Challenges in an Business Organisation

Jurgis Kazimieras Staniškis

> Almost always the men who achieve these fundamental inventions of a new paradigm have been either very young or very new to the field whose paradigm they change—Thomas S. Kuhn, American philosopher of science

1.1 The Development of Sustainable Development Concept

> Today's problems cannot be solved if we still think the way we thought when we created them—Albert Einstein, German-born physicist

Adam Smith (1776) along with many others at that time saw nature as "no more than a storehouse of raw materials for man 's ingenuity". The eighteenth century was a period that witnessed the birth of the Industrial Revolution, modern growth–based economics and what recently has been termed "consumer revolution". Inventers produced new machines that eventually revolutionised the global economy and changed the course of human history (Caradonna 2014).

The main idea of classical economics is that a free market regulates itself, bringing products and services to consumers and profits to producers and sellers without the active intervention of the state. Adam Smith in "Wealth of Nation" argues that the wealth of nation is essentially the annual product of its labour and must be continually increased. It meant the privatisation of publicly owned land and increased consumption of natural resources. In short, the eighteenth century set the stage for an enduring conflict over social, economic, and environmental costs of economic growth that have played out throughout the nineteenth century and down to present days. Historians have only recently discovered that strong hostility towards greed, consumerism, and growth that later was called the Industrial Revolution was fairly developed in this period.

One of the most famous critics was Jean–Jacques Rouseau who has influenced intellectual life and the history on sustainable development, for instance, by his statement that technological innovation did not make humans any happier or virtuous,

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his critique of social inequality and its link to the natural environment, and admiration for wilderness, rural values, and simple living (Caradonna 2014).

An important moment for sustainability came in 1980 when the UNEP formed the International Union for the Conservation of Nature (IUCN) and produced the report "World Conservation Strategy: Living Resource Conservation for Sustainable Development". Despite the fact that this report emphasised the interrelationship between environmental, economic, and social problems, it said relatively little about social justice, poverty, inequality, faulty economic and financial systems, and other subjects addressed in the UN documents on sustainable development. In 1983, the General Assembly of the United Nations urgently asked the World Commission on Environment and Development (WCED) to create a global framework for sustainable development, "a global agenda for change". The UN Secretary General appointed the members of the independent commission *(Chairwoman—Gro Harlem Brundtland, Vice-Chairman—Mansour Khalid, principal author of the document—Jim MacNeill)* and asked to address the major challenges to the global community:

- to promote long-term environmental strategies for achieving sustainable development;
- to recommend ways concern for the environment might be translated into greater co-operation among the developing countries and between countries at different stages of economic and social development and lead to the achievement of common and mutually supportive objectives that take account of the interrelationships between people, resources, environment, and development;
- to consider ways and means by which the international community could deal more effectively with environmental concerns; and
- to help define shared perceptions of long-term environmental issues and the appropriate efforts needed to deal successfully with the problems of protecting and enhancing the environment, a long-term agenda for action during the coming decades, and aspirational goals for the world community (WCED 1987).

WCED produced an excellent report "Our Common Future" that eventually became known as the Brundtland Report. The report presented sustainable development as the development, which "meets the needs of the present without compromising the ability of future generations to meet their own needs".

This seems like a rather human–centred definition of sustainability; however, it introduced the innovative "intergenerational equity" principle in order to encourage people to think more deeply about the possible future consequences of what they do in the present. The publication of the Brundtland Report reflected the fact that the United Nations had taken the lead in contemplating the global dimensions of the sustainability challenge (Orr 2016).

What is wrong with the sustainable development concept? Robinson argues that sustainable development suffers from three conceptual pathologies: it is vague, attracts hypocrites, and foster delusions, i.e. if development is seen as synonymous with growth, then sustainable development means ameliorating, but not challenging continuing economic growth (Robinson 2004). The problem that many scholars have pointed out is that sometimes "development" is attached to the word "growth", and if

that is the case, "sustainable development" is not a concept that favours a steady–state economy or ecological stability, but is rather a convert and greenwashed vehicle for business-as-usual economy. We have to decide whether society would come about through deregulated financial systems and growth-based economics or through regulated economic systems and the cessation of pro-growth policies. What is definitely clear, that "sustainable development should be pursued in the spirit of finding pathways that enable a good life for all, leaving no one behind, while safeguarding the environment for future generations and ensuring planetary justice". Economic activity should be seen not as an end in itself, but rather as a means for sustainability-advancing human capabilities (IGS 2019). In other words, "the ultimate purpose of business is not, or should not be, simply to make money. Nor is it merely a system of making and selling things. The promise of business is to increase the general well-being of humankind through service, a creative invention and ethical philosophy" (Hawken et al. 1999).

The Brundtland Commission's definition embraced two crucial elements of sustainable development such as the meeting of basic needs and recognising environmental limits, where overriding priority should be given to the world's poor and the principles of intergenerational and intragenerational equity. This definition is often criticised as vague, or in the language of some experts, non-operationalisable. Certainly, it is always difficult to put everything in a short definition, but there is no doubt that it presents the main idea of sustainable development. It should also be mentioned that critics, especially when it comes to language, so far have not suggested anything better. It became evident that many countries in the world meet serious difficulties in finding a meaningful translation of "sustainable development" to national languages. Besides that, there is another endless question: are sustainability and sustainable development the same thing? This is a strange question to ask. From the systems theory point of view, "development" is a process, and "sustainability" is the final state of the object. The "development" is NOT a synonym for "growth". Development could be degrowth, stable state or growth, depending on the country/regional economic, environmental and social situation, defined by the system performance index, boundaries and limitations (see chapter on mathematical formulation of the problem). Such formulation of the problem and possible solutions show the understanding of the sustainable development meaning and allow for its operationalisation.

Sachs elaborated his own definition: "Sustainable development is a process, a way of solving our problems peacefully and globally, using our science and technology, our know-how, and our shared global ethics to address our common needs. Our most basic common link is that we all inhabit this small planet, we all breathe the same air, we all cherish our children's futures, and we are all mortal" (Sachs 2006). Brice Lalonde, former Minister for the Environment in France, presented his version: "Sustainable development refers to how the economy should enable us to live better lives while improving our environment and our societies, from now on and within a globalised world."

A new and distinctive definition of sustainability was suggested by Ehrenfeld: "the possibility that human and other life will flourish on the planet forever. Flourishing is the key to the vision of sustainable future, and this way of conceptualising sustainability connects to every kind of audience I have addressed. To me, the most basic symbol of sustainability is that of flourishing. It pertains to all natural systems, both human and other living systems. For humans, flourishing means more than just remaining healthy. It also means the good life, following precepts handed down over the ages by sages and philosophers. We must shift back to the flourishing fullness of "Being" from its impoverished modern form of "Having" (Ehrenfeld 2009).

There is a growing awareness that our global economy is environmentally unsustainable. Economic activity since the industrial revolution has delivered significant improvements in living standards, but has also caused growing environmental pressures. Our prosperity depends on a wide range of resources and services supplied by our planet, from fresh water, metals and minerals to crop pollination performed by bees. In the meantime, the economy is not delivering quality of life for a huge section of the world's population. Most of the resources and environmental services are overexploited and underpriced, or not valued at all in today's economy. Unsustainable forms of development are not evenly distributed across the world. Some lifestyles lead to a greater depletion of the Earth's resources than others, and some people will be more vulnerable to changes in the ecosystems than others. It is necessary to understand which key values engender the feeling of connectivity and foster greater sustainability. Empathy, for instance, is believed to be an important value both in terms of global interconnectedness and long-term thinking. Our deeply ingrained consumerist culture may be challenging to shift, but values-based action is a critical lever of change.

The global campaign to end poverty started ramping up after 2000, in the wake of the United Nations' Millennium Development Goals, but the emergence of global goals to fight poverty was a great spur to accelerated progress and increased action. After debates, the high-income countries were asked to provide just seven-tenths of one per cent of GDP. As of 2015, there were only five countries that met the 0.7 pledge: Denmark, Luxemburg, the UK, and Sweden with the Netherlands following close with 0.65. The arguments of aid foes have been that "aid is not needed (economic growth is available without it to anyone and any place that really tries), and that aid is invariably wasted (governments are corrupt, untrustworthy, incompetent, and therefore unable to channel resources as promised, no matter how nice and worthy the goal)" (Sachs 2006).

While economists are typically emphasising carbon pricing as a policy tool to tackle global warming, natural scientists and transdisciplinary environmental research groups argue for deeper political engagement and proactive economic transition governance (Barnosky et al. 2014)—something akin to the Global Marshall Plan (Gore 1992). This difference in perspective is in part due to the relatively recent advancements in environmental research, measuring faster-than-expected decline in natural ecosystems and taking into account the whole range of human-induced pressures, not just climate emissions (Järvensivu et al. 2018).

As Hall and Klitgaard (2011) have shown, today's dominant economic theories, approaches, and models were built during the era of energetic and material abundance. The theories were only temporarily tested by the oil crises of the 1970s and the 1990s, with no remarkable theoretical or political changes. Thus, the dominant economic theories as well as policy-related economic modeling rely on continued energetic and material growth. The theories and models anticipate only incremental changes in the existing economic order. As such, they have difficulties explaining the current turmoil (Järvensivu et al. 2018).

Standard models take no account of the use of finite resources and environmental constraints, and are blind to social outcomes in terms of equity and, of course, human well-being.

Macroeconomic models are open-ended by nature, with growth being the primary output of interest. Inputs feed in, interact with each other, achieve balance (or equilibrium) and outcomes result. We need to reverse this. That is, to start with the hard outcomes we need: environmental sustainability; equitable social and economic justice; and high levels of human well-being. To link these to relevant economic determinants within the model (aggregate output, income distribution and working hours, respectively, for example) and to reverse-engineer what this would imply for the levels and types of differing inputs (Jackson 2009).

Sustainable development is a new framing concept and radical philosophy to redefine economic paradigm/progress, which is itself the cause of so many environmental and social problems, for instance, inequality. A fifth of the world's population earns just 2% of global income; at the same time, the richest 20% by contrast earn 74% of the world's income. To have any chance of achieving a sustainable economy vision, the financial markets need to allocate capital differently. At the moment, finances do not flow in support of activities that shape a sustainable economy. By sharing our resources more equally, by building better communities and a better society and by safeguarding the natural environment, we can focus on the things that really matter and achieve genuine and lasting progress with higher levels of well-being.

When we think about the kinds of changes that will be required to bring this about, it is tempting to focus just on the practical issues—financial regulation, taxation and welfare policy, or reducing our carbon intensity—and we will be coming to these issues in detail later. Nonetheless, we need to remember that, as important as these are, in a democracy, none of these changes will come about without the will and desire of the people. People are not like the passive automats of economics textbooks. They have goals, beliefs and aspirations and they actively construct the world around them through the ways in which they talk, behave and make meaning. The main process towards sustainability is socio-economic transformations as co-evolutionary processes that include changes in modes of production, work relations and culture. Although technological innovations have played a key role in the marketisation of society, their potential alone to enable transformations to sustainability is questionable. When lowering prices, efficiency gains often lead to increased consumption, undermining environmental benefits and thus undermining environmental benefits and reinforcing the dominant paradigm of consumerism and materialism (Kemp et al. 2007).

The ultimate goal of transforming towards sustainability is a resilient, equitable, low carbon economy and production based on interconnectedness, our shared past, our common future, and environment on which we depend for life.

1.2 Conventional Economy and Sustainable Development. The Dilemma of Growth

> Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist—Kenneth Boulding, economist, UK

Economic globalisation manifested more clearly in the rising dominance of the multinational corporations by posing the need for global, rather than national or sub-national action.

"The world as an experiment has existed for only 40,000 years. Of those, the Western variant has been with us for only 250 years, and in that speck of time, more has been done to destroy the conditions for life than in the whole of the preceding 39,750. Destroyed conditions of life mean lost opportunities, not only in the present but also in the future. This too is a way of describing globalisation—as an accelerating process of social entropy, which dissolves cultures and finally, if things turn out badly, leaves behind only the bare, undifferentiated will to survive. To be sure, in the actual course of its history—from modern slave labour and ruthless exploitation of the colonies to early industrial destruction of the conditions for human life, which had nothing to do with the project—the free, democratic, enlightened West eventually wrote its counter-history of un freedom, repression and counter-enlightenment. With the future impact of climate change, the Enlightenment will not be able to free itself from this dialect. It will fail because of it" (Welzer 2017).

> The success of our economy has always depended not just on the size of our gross domestic product but on the reach of our prosperity; on the ability to extend opportunity to every willing heart, not out of charity but because it is the surest route to the common good.
>
> US President Barack Obama, Inauguration speech, 2009

Post-Keynesian analysis is historical in nature: markets would not and do not exist without political regulation. Consequently, the Post-Keynesian approach is not a priori wary of the state's role in the market. It does not see markets as always equilibrium-seeking but maintains that capitalist economies have tendencies toward market bubbles and other crises. Markets do not lead to socially and ecologically desirable outcomes on their own but require active political guidance (Järvensivu et al. 2018).

Standard neoclassical economic paradigm is a product of the Newtonian world-view and thus, is exclusively concerned with qualitative outcomes. Only quantitative-based values and measures are utilised to indicate the state of the macro-economy and the success or failure of economic policies. Qualitative terms such as development and human welfare are key elements of the economist's system of thought.

It is now widely accepted that the twentieth century advances in thermodynamics and evolutionary-based theories have greatly exposed the limitations inherent to the Newtonian view. The Newtonian world-view assumes that the nature of the parts of any system and the relations between them remain unchanged and, as a consequence, within the system activity does not alter its underlying parameters, nor those of other systems. Particular aspect, totally ignored by the Newtonian world-view, involves the positive feedback of system dynamic over time. Positive feedback is a form of dynamic disequilibrium and occurs when the creation, modification and introduction of new or modified components alter the system's future dynamics. Neoclassical economic models fail to acknowledge the powerful relationship that exists between human belief systems and the functional operation of economic systems, and the markets of which they are comprised (Lawn 2000).

The conventional economy paradigm suggests that the best way to address the problem of huge disparity is through growth itself. In a world without limits, it would be acceptable to lift the poorest out of poverty by growing the entire economy. However, the existence of ecological or resource limits poses a more pressing moral question. Another possibility would be to achieve substantial technological improvements in the efficiency with which material resources are converted into economic output. In this case, our faith is in the possibility that we can push relative decoupling fast enough that it leads in the end to significant absolute decoupling. Here is the question: how feasible is this? Decoupling of growth and environmental pressures has been the main hope and focus of politics so far and a large part of economics—witness the recent popularity of the notion "green growth". This notwithstanding, decoupling in unlikely to be fast enough in all relevant environmental dimensions, if successful at all, which means that growth may be at stake when we go for a serious sustainability policy (Antal and Van den Bergh 2013). As Jackson (2009) argues and as the climate research of the New Economic Forum has shown, there is absolutely no evidence to support this—quite the opposite in fact: the scale of output continues to outstrip efficiency gains and no economies have dematerialised to any meaningful extent or show any signs of doing so. The reasons for this have long been well understood, though largely ignored. Environmental economist Herman Daly put it like this: "The notion that we can save the "growth forever" paradigm by dematerialising the economy, or "decoupling" it from resources, or substituting information for resources, is fantasy. We can surely eat lower down the food chain, but we cannot eat recipes" (Daly 1997).

The focus on life-improving and emissions-reducing goals rather than abstract economic goals also characterises the relations between the developing and developed countries: economic activity between them consists of bidirectional learning in order to build new locally suitable infrastructure and practices at both ends. This kind of proactive state-led economic governance toward self-sustained, low-emission production and consumption runs contrary to the currently dominant world political order, which has been organised around international free trade. In the modern global economy, states are the only actors that have the legitimacy and the capacity to fund and organise large-scale transitions. The most emblematic event of a polarised view of industrial capitalism period came in 1981, when Reagan removed the solar panel

from the roof of the White House that President Carter had so gladly and symbolically installed.

The main features of conventional economics are:

- Strong emphasis on the efficiency with which the main inputs to production, i.e. capital, resources, and labour, are utilised. Efficiency stimulates demand by driving down costs and contributes to a positive feedback and production expansion at the same time.
- When economic growth is less than increase in labour productivity, someone somewhere loses their job. From an environmental point of view, this could be even desirable because it leads to lower resource use and fewer polluting emissions. However, from the existing macroeconomic system point of view, such situation leads to recession, because growth equals jobs.
- Conventional macroeconomic system model based on growth and competition does not have a steady state regime (weak resilience) and is continuously pushed towards one of the two dynamic states: expansion or recession.
- The key issue of an economic system is profit, which stimulates a permanent search for newer, cheaper products and services. This process of "creative destruction" (Joseph Schumpeter 1942) is a fundamental feature of capitalism, driving the economic growth forward. The restless desire of the consumers is perfect complement for the restless innovation of the entrepreneur (Jackson, 2017). This means that an economic system remains viable as long as consumption rises.
- According to the research of Mazzucato (2018), achieving system-level transition has required and will require proactive mission-oriented innovation—it is not enough for the state to reactively fix the "market failures". Many economists have settled for carbon pricing as the least interventionist, economically most efficient "first-best" policy to cut the greenhouse gas emissions.
- Many economists and politicians hope that carbon pricing can be accomplished via carbon taxes or emissions caps and permit trading ("cap-and-trade"). As a policy tool, carbon pricing lacks the crucial element of coordinating a diverse set of economic actors toward a common goal. Individual actors would have an incentive to decrease carbon emissions, but they would still compete through their own business logics with nothing to ensure that a particular business logic supports the sustainability transition on a systemic level.
- Incomplete and wrong indicators, for instance GDP, are used to determine the economic progress.
- The assumption that if the developing countries were to implement conservative macroeconomic policies while expanding the role of the private market at the expense of the state, they would then achieve sustained high growth rates on their own as well as the statement that if such country is failing to grow, the problem must be either macroeconomic mismanagement or a hindering of private market expansion in the country, usually attributed to corruption or more broadly "bad governance" are unsatisfactory (McCord et al. 2005).

The main critique of conventional economics—the ideas that underpin the rules by which the world is run—lies in the fact that it is primarily critical of the way that money measures the world:

- It ignores the planet (and people);
- It measures the wrong thing (GDP);
- It misunderstands the real life (rationality, invisible hand, dynamics);
- It encourages vulnerability (poorly defended due to subsidies);
- It colludes with short-termism (short electoral cycle);
- It overvalues owners;
- It remains blind to values (ethics behind a product);
- It encourages consumption for its own sake (fuel for growth);
- It encourages and relies on debt and indentured legal agreements.

Taken together, these criticisms reveal not just an economic system that is partially blind, but one that has no moral compass and is destructive of the environmental conditions on which the civilisation depends. The numbers from numerous studies revealed that once societies move past approximately 15,000 USD per capita income, neither objective measures of quality of life, nor subjective measures like life satisfaction show any material improvement. Our current system is designed for growth; that is what keeps us employed, services flowing from government via taxes, and the poor believing that they can escape from poverty. Without growth, there is a danger that the whole house of cards will come crashing down.

The global economy output is now almost ten times bigger than it was in 1950. If it continues to expand at the same average rate, the world economy in 2100 would be more than 20 times bigger than it is today: a staggering 200-fold increase in economic scale in the space of just few generations. It is totally at odds with our scientific knowledge of the finite resource base and the fragile ecology on which we depend for survival and it has already been accompanied by the degradation of an estimated 60% of the world's ecosystem (Jackson 2017).

Current rates of carbon emission are thought to be higher than at any time in the last 65 million years. The concentration of carbon dioxide in the atmosphere has risen sharply since 1850 and is now around 410 parts per million. One of the biggest signs of our time will be the presence of three things we use every day: concrete, plastics and aluminium. We have now produced around 500 million tonnes of aluminium, about 50 billion tonnes of building materials and we now produce more than 300 million tonnes of plastics a year (New Scientist 2018).

The critical factor of economic and financial crisis was a massively "over-leveraged" private sector. Households and firms were simply carrying on an unsustainable amount on debt. However, the most striking aspect of this over-indebtedness is just how long it had been going on. Indeed, it is a feature of the system of debt that for one part of the global economy to be indebted, another part must be saving hard (Hall and Soskice 2001). For instance, the so-called liberal market countries led the march towards liberalisation, competition, and deregulation in the period of 1980–1990. The coordinated market economies—the countries of "old" Europe and Scandinavia—were much slower to deregulate and tended to depend heavily