

Basics of sustainability

Foundations and Challenges of sustainability

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Preface

This introduction to the foundations and challenges of sustainable development is aimed at students and lecturers who deal with the most pressing issues of our time from different disciplinary perspectives. It arose from the desire to promote a common understanding - across disciplinary boundaries, in teaching, research and social practice.

The world as we know it today is characterised by a multitude of interwoven crises: Climate change, loss of biodiversity, social inequalities, economic instability and political polarisation - in short, a polycrisis. These challenges are neither linear nor easy to solve. They call for a profound rethink of our economic, social and ecological systems, our actions and our idea of development and progress.

Against this background, this textbook sees itself as a shared learning space: it offers systematic access to central concepts, scientific perspectives, normative questions and specific fields of action for sustainable development. The aim is not only to impart knowledge, but also to promote the ability to reflect, think critically and be creative.

This book was written in the context of the study programmes of the Centre for Development and Environment (CDE) at the University of Bern. It reflects the many years of experience in research and teaching on sustainable development and brings together contributions from various disciplines - from environmental sciences, geography and economics to sociology, ethics and law.

Special thanks go to all the authors who have contributed to the creation of this book with their expertise, passion and commitment. We would also like to thank the students, whose critical questions and perspectives are a key driver for the further development of the content. After all, sustainable development is not only a scientific project, but above all a social project - and this begins with education.

We hope that this book will provide a sound basis for your own engagement with sustainability - and encourage you to take responsibility and play an active role in shaping a fair and sustainable world.

About the book

To contribute to sustainable development, we need to analyse the causes of symptoms such as biodiversity loss or global warming, and learn to understand how they are connected and how they interact. We will therefore look at current problems and challenges such as global warming, pollution, biodiversity loss, social inequality, and economic disparities, to understand how they can be tackled at both the local and the global level.

The aim of this textbook is to encourage readers to think critically about the role of individuals, communities, businesses, and governments in the context of sustainable development – and thus to identify and pursue approaches to support sustainable development. In addition, we want to develop visions of the future, especially in the Master's study programmes, that make it possible to imagine a high quality of life in a sustainable modern age, and that make changing the present seem attractive rather than daunting. We want to envision a different food culture, a different economic system, a different type of land use, and a different way of building and living. To make progress towards sustainability, it will be critical to engage stakeholders and foster collaboration across sectors and disciplines. As this textbook will emphasize, education, communication, and participation will also be indispensable in shaping a more sustainable future. With Christo's Wrapped Globe in mind, and Daly's understanding of the empty and the full world as a foundation, we will embark on a journey through the many aspects of sustainable development. We hope that you will find this journey both informative and inspiring, and that it will give you an understanding of both the urgency and the opportunities for sustainable development.

Finally, we hope that our study programmes will inspire students to reflect on their own roles and responsibilities in relation to sustainability, and that it will equip you to make a difference to ensure that the Earth remains a place worth living in for future generations. Only together can we bring about the changes needed to create a sustainable, just, and environmentally friendly world.

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Reading guide

Definitions and further readings

Examples and reflections

Exercises and links to ILIAS

Introduction



Figure 1: “Wrapped Globe (Eurasian Hemisphere)” by Christo (2019)

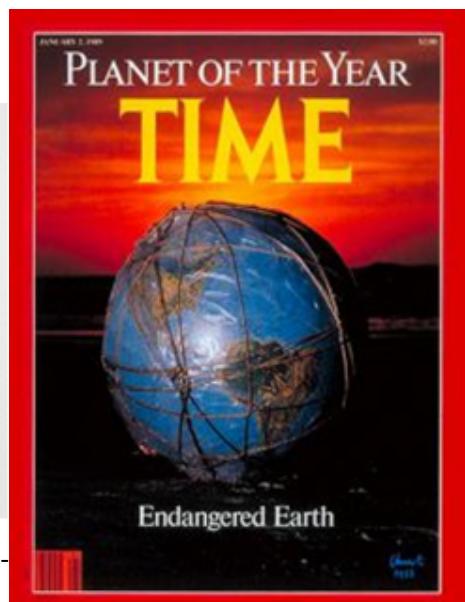


Figure 2: “Planet of the Year” Times Magazine Cover (1989)

Amid the mounting challenges of sustainable development, Christo and Jeanne-Claude’s “Wrapped Globe” is a powerful symbol of humanity’s responsibility towards our planet and its resources. The artwork depicts a globe wrapped in transparent plastic and a filigree net. Meanwhile, in real life, the world is facing a “polycrisis” – the word used to describe the many serious crises our Earth is facing, including ecological crises, growing inequality, excessive national debt, and the effects of the Covid-19 pandemic, to name but a few. In a polycrisis, crises are increasingly intertwined and mutually reinforcing (Tooze 2022), and they are mainly caused by a structural dependence on growth (as measured by gross domestic product, GDP) (Hickel et al., 2022; Sennholz, 2021); a vicious circle of ever-increasing concentration of economic and political power in the hands of a few (Piketty, 2014); and persistent inequalities between and within countries (Chancel et al., 2021; Milanovic, 2016). And yet, we keep striving for GDP growth in our society and our economy, in order to maintain and create jobs, finance our social security systems, secure tax revenues, and fulfil the

needs of companies and industries that depend on growth to exist. As these expectations become increasingly unrealistic, the idea of decoupling economic growth from resource consumption has gained traction. However, there is no empirical evidence that doing so will achieve anywhere near the scale required to halt multidimensional ecological collapse (Parrique et al., 2019; Hickel and Kallis, 2020; Wiedmann et al., 2020).

Full and empty world

The plastic cover and the net wrapped around Christo's globe thus represent the interconnectedness and interdependence of the Earth's various elements, and emphasize the need to maintain and preserve these relationships. A similar idea was described by the economist Herman Daly (2015), who put forth a concept of the "empty" and the "full" world. The empty world describes a situation in which human activities and resource use have only a minor impact on the environment. In this world, natural systems are still intact and untouched, and resources are sufficient to meet human needs. This contrasts with the full world, in which human activities and resource use overload the ecosystem and pollute the environment. Since at least the Second World War, we have pursued an industrialized society and a growth economy. As a result, we now live in a "full" world, where natural resources are scarce and the balance of ecosystems is under threat. Daly's epiphany came in 1962 upon reading Rachel Carson's book, *Silent Spring*, which called for a life in harmony with nature. Daly was already sceptical about the hyper-individualism of economic models, and Carson's work highlighted the conflict between a growing economy and a fragile environment. Following a lecture by the economist Nicholas Georgescu-Roegen on his magnum opus, *The Entropy Law and the Economic Process* (1971), Daly adopted the idea that the economy was more like an hourglass than a pendulum, with valuable resources turning into waste and thus largely irreversibly lost. There is no master plan to counter the polycrisis and make our economic and social system more sustainable.

Part I

Foundations

Chapter 1

Understandings and concepts of sustainability

Where do the concept, mission statement, and guiding principles of sustainable development come from? How did the concept emerge, how did it evolve – and why? The following explanations provide an overview of the history of sustainability, the political background, and key conferences and documents. In short, what has made sustainability what it is today. It's about seeing the big picture. Because only those who know the past can assess the future.

Sustainability has been the buzzword of recent years, from science to politics and business to the media. Initially, the term has a positive connotation because it is associated with the long term, the durable, and many things are sustainable today: coffee, corporate philosophy, even tuna pizzas. These are the demands of a consumer society with an inconsiderate appetite for abundance. First thing in the morning, the shampoo removes our dandruff “sustainably”. Then we drive to work at a company that prides itself on its “sustainable corporate philosophy”, and over lunch we discuss sustainable investments. At home, we stick a tuna pizza in the oven – sustainably sourced and produced, of course, as it says on the box.

Today, the term “sustainability” is everywhere: it’s used in connection with energy, mobility, building renovation, nutrition, population development, corporate environmental management, and climate protection. It’s also used in art, culture, design, and advertising.

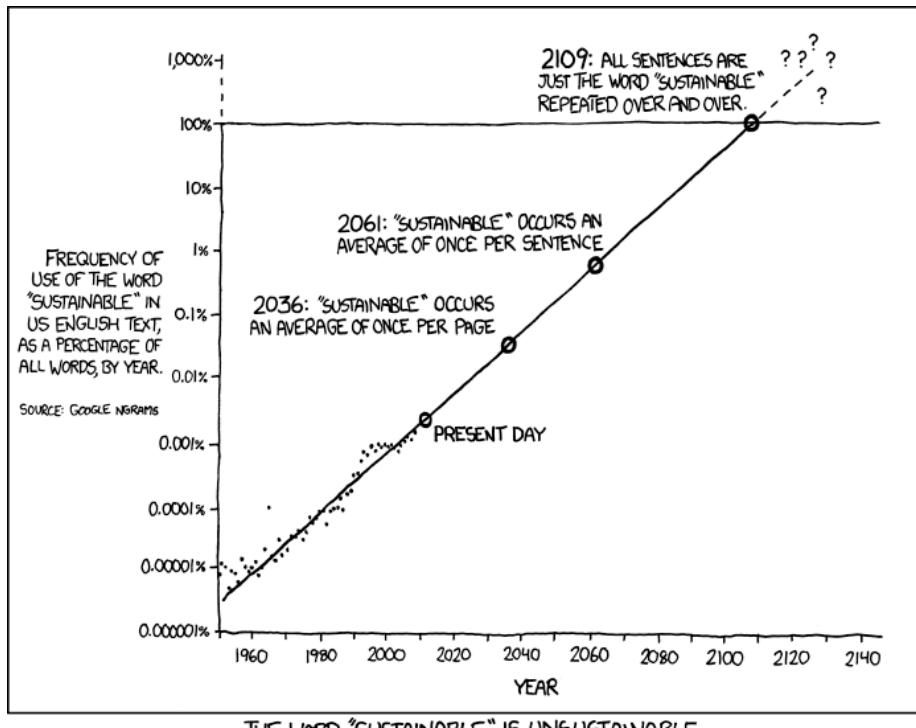


Figure 1.1: Frequency of use of the word “sustainable” in US English texts, as a percentage of all words per year, based on data from Google Ngrams. Source: <https://xkcd.com/1007/>

Is the term “sustainability” so overused as to slowly become meaningless? Even if this is the case, we shouldn’t abandon key terms like this lightly. For example, it’s still important for companies to have a sustainability strategy, even if many such strategies are inadequate or amount to greenwashing. We need to clarify the meaning of “sustainability” and hold those who use it to account. And we should base our interpretation on science and historical developments. The historical precursors to the sustainability model explained in this textbook are:

- Start of the discussion about sustainability: Carlowitz’s forest management principle of 1713
- Clash of economy and ecology First and second UN Development Decades (1960s and 1970s)
- The Limits to Growth (1972)
- Brundtland Report (1987)
- Rio Earth Summit 1992 Agenda 21 UN Millennium Development Goals (MDGs) (2000–2015)
- 2030 Agenda with the Sustainable Development Goals (SDGs) (2015–2030)

1.1 A normative concept

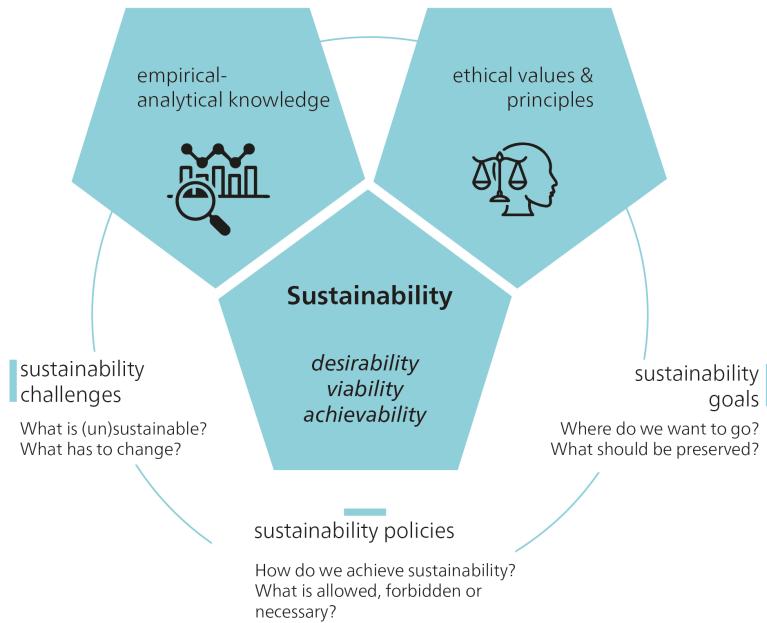


Figure 1.2: Sustainable Development as a normative concept (Own illustration).

To achieve sustainability, we need **sustainable development**: a strategic process that requires changes in our socio-ecological systems and institutions. “Development” implies controlled improvement, and the ethical question of what exactly “better” means is key. The use of the term “development” has been criticized by some (e.g. Lang et al. 2014; Kothari et al. 2019), as it is often equated with unbridled growth. Unbridled growth of the “ecological footprint” – the proportion of the biosphere used for human production, consumption, and waste – is unsustainable in the long term. Nonetheless, there are different interpretations of “development”, ranging from economic growth to improving quality of life. Sustainable development therefore remains a stimulating and controversial concept. Sustainability and sustainable development play a key role in today’s political discourse. The term “unsustainability” refers to conditions or developments that are considered negative, while “sustainability” represents a positive state.

The concept of sustainable development commits us to certain values and norms that define ethical goals and rules of behaviour. These values and norms shape our ideas of what we consider a desirable or “positive” change. A neutral point of view is not possible, as our perceptions are shaped by a variety of influences. Our personal experiences, upbringing, social environment, and cultural background all influence how we see and interpret the world, including our perceptions of what “should be” and what actions “should be taken”. Ethics play a key role in determining how the current situa-

tion can be improved to achieve sustainability, by defining normative goals and limits. Sustainable development is therefore a conceptual framework that is strongly driven by ethical considerations.

Sustainability challenges such as poverty reduction and climate change are therefore ethical challenges. The identification of situations as sustainability problems (and therefore as “negative”) and the choice of solutions are based on ethical values. Sustainability goals are also based on ethical values, as well as on knowledge of cause-and-effect relationships. Sustainability issues are often referred to as “wicked problems”, because of their complex and pluralistic nature. Global warming, in particular, has been described as a “super wicked problem”, as finding solutions is urgent, political institutions are often inadequate, and decision-making processes suffer from short-sightedness.

1.2 Global challenges as wicked problems

Mike Hulme, author of *Why We Disagree About Climate Change* (2009), suggests that we view climate change as a “wicked problem” of enormous scale and likely longevity. This approach helps us see climate change not as a problem that needs to be solved, but as a condition in which we are directly involved. The categorization of problems as “wicked”, i.e. those that do not lend themselves to clear-cut solutions, originated with the planning theorists Horst Rittel and Melvin Webber (1973). They argued that planners have to deal with unpredictable human behaviour, and that some problems are too complicated to be solved completely. Some “wicked problems” may never be fully solved, but we can learn to cope with them and not let them dominate us.

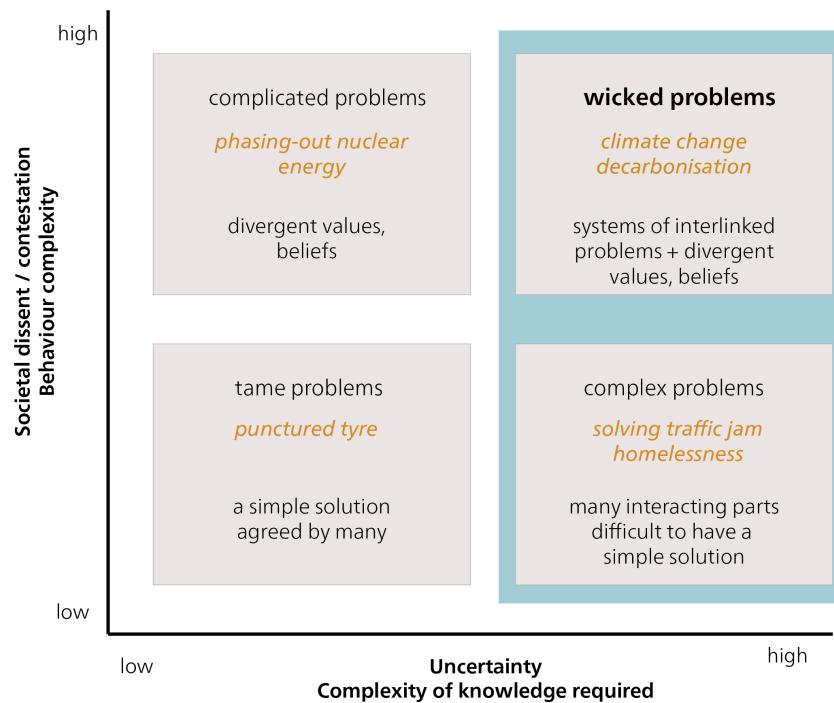


Figure 1.3: Sustainability challenges as wicked problems. Source: Own illustration based on Roth, G. L., & Senge, P. M. (1996)

Wicked problems

According to Bannink and Trommel (2019), wicked problems arise at the intersection of factual uncertainty and a heterogeneity of preferences and interests. Wicked problems are characterized by (Rittel & Weber, 1973; Alford, 2017; Sediri, 2020):

- **Complexity:** Wicked problems are characterized by many interrelated factors and interactions. There are no clear cause-and-effect relationships, and changes in one area can have unforeseen effects in other areas.
- **Normative conflicts:** Wicked problems are perceived and interpreted differently by different stakeholders and interest groups. There is no clear definition or consensus on what exactly the problem is, or how it should be solved.
- **Interdisciplinarity:** Wicked problems require an interdisciplinary approach as they involve different topics, perspectives, and stakeholders. Finding a solution often requires the cooperation and coordination of different disciplines and experts. Uncertainty: Incorrect, missing, or inaccessible information about the problem situation and about the continuity of the values of the variables involved.

- **No definitive solution:** Wicked problems defy clear-cut solutions. They are dynamic, change over time, and require continuous adjustment and iterations.

Examples of wicked problems include climate change, poverty alleviation, global health, and sustainability. The complexity and interaction of different factors in these areas make it difficult to find simple and clear-cut solutions. Dealing with wicked problems requires a high degree of reflection, collaboration, and the use of systemic thinking methods.

How have we manoeuvred ourselves into the current situation, where wicked problems pose such a challenge to sustainable development? In this textbook, we will analyse and learn to understand three key global challenges:

- the emergence of human-induced global warming;
- the persistence of global poverty and rising inequalities;
- and the threat of species extinction and overexploitation of natural resources.

The debate about human influence on global warming and climate change has intensified since the publications of the Intergovernmental Panel on Climate Change (IPCC). The driving force behind global warming is our dependence on oil and other fossil fuels for transport, (electricity) generation, agriculture, and many everyday products. Another wicked problem is global poverty. Although there have been global efforts to reduce poverty for decades, the globalized market economy often leads to increased poverty in certain regions, and the gap between rich and poor seems to be widening overall (Chancel et al., 2021). High-income countries have maintained their prosperity and living standards at the expense of others. These are “externalized costs”, and they include environmental degradation. For example, the wealth and living standards of high-income countries are largely responsible for the threat of species extinction and the overuse of natural resources (Lessenich, 2018). In addition to the above mentioned “big three” – climate change, poverty, and biodiversity loss – there are many other global sustainability challenges, such as deforestation, desertification, declining soil fertility, dwindling fish stocks, pollution, wars, conflicts, and increasing migration.

In analysing these comprehensive challenges we must also consider the temporal dimension. In 2004, graphs depicting socio-economic and Earth system trends from 1750 to 2000 were first published, revealing a dramatic upsurge and aptly termed “The Great Acceleration” (Steffen et al., 2004).

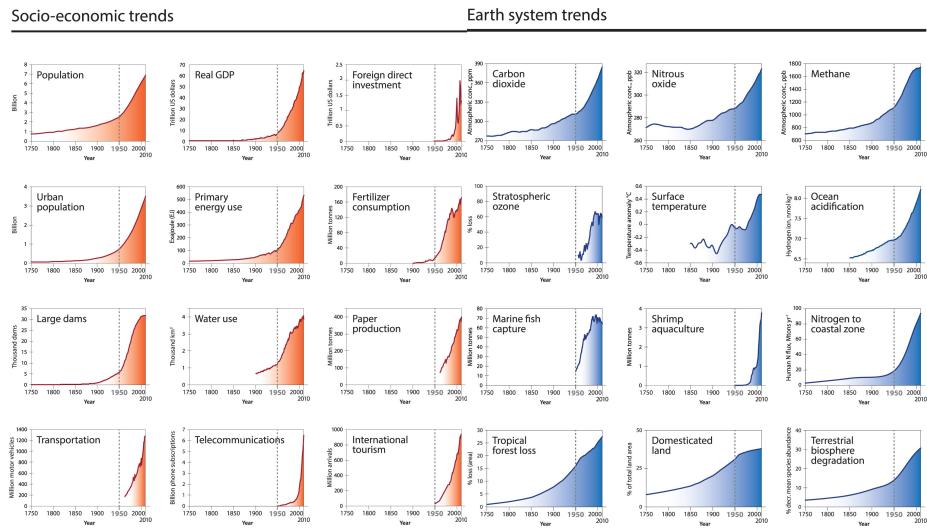


Figure 1.4: 12 socio-economic and 12 Earth system trends from 1750 to today are a strong indication that the Earth system has entered a new state. Source: <https://futureearth.org/2015/01/16/the-great-acceleration/>.

The Great Acceleration described the exponential growth dynamics that occurred as a result of the Industrial Revolution, which led to a surge in productivity in the mode of production and a significant increase in material wealth. At the same time, but to a much lesser extent, there was a massive increase in natural resource consumption and emissions. Socio-economic growth went hand in hand with the acceleration of biophysical trends. Figure 1.4 describes some examples of important biophysical and socio-economic indicators, all of which start to increase with the Industrial Revolution. From the middle of the 20th century, the trend towards exponential growth becomes apparent.

The Wheat and Chessboard Problem: an illustration of exponential growth

The Wheat and Chessboard Problem is a mathematical problem often used to illustrate the concept of exponential growth. In the story, a servant asks the king to fill every square on a chessboard with grains of wheat, doubling the number on each square. Growth starts slowly, but with each doubling, the number of grains increases exponentially. By the 50th square, the number of rice grains would be large enough to cover Berlin's 365-metre-high television tower on Alexanderplatz. This story illustrates the immense power of exponential growth and its impressive results. Understanding the concept of exponential growth is crucial to analysing phenomena such as population growth, technological progress, environmental change, and the spread of disease. It illustrates how even small changes or developments in a system can have a significant impact. History reminds us that we need to think carefully about how we manage such growth and the long-term consequences it can have.

Resource extraction has increased significantly in recent decades, from 22 billion tonnes in 1970 to 70 billion tonnes in 2010 (UNEP, 2016). Global warming is another press-

ing issue. The latest IPCC report (IPCC, 2023) predicts an increase in global average temperature of between 1.5 and 5.8 degrees Celsius, depending on the scenario and future emissions. Another alarming phenomenon is deforestation. Every two seconds, an area of forest the size of a football field is cut down – an area the size of New York City every day. And then there is the decline in biodiversity, marked by the extinction of animal and plant species, which threatens the ecological diversity of our planet.

The Great Acceleration (Figure 1.4) describes the observable and measurable (negative) developments of key socio-economic and biophysical indicators since 1950. The causes of these negative developments can be far removed from the place where the problems arise or become most evident. For example, job losses in one country may be caused by a multinational company’s decision to relocate part of its operations to another country, in order to maximize profits. We cannot hope to fix such issues unless we understand how the system – in this case, the globalized economy – works. Similarly, we need to understand the Earth’s global climate systems to imagine what the consequences of global warming might be in a particular area or region.

This is why many of the methods and concepts of sustainability science require systemic thinking. A systemic thinking approach often begins with brainstorming to create a “rich picture” of all the factors you need to consider in order to understand the current behaviour of the system in question. For example, in the case of a multinational company closing a particular business unit, these would be the factors that might influence the decision to continue, expand, or close certain business units. While an initial mapping might look overly complex or even messy, creating a linear flowchart can help clarify the flows of inputs and influences. This kind of mapping may already reveal opportunities to reassess the relevant influences and redesign the system to avoid unwanted outcomes. However, further work may be required to develop “conceptual models” of the system that identify unforeseen opportunities for improvement.

Incorporating systemic thinking into the methods and concepts of sustainability science enables us to tackle the complexity of problems and develop sound strategies for sustainable development. Systemic thinking thus provides an important basis for understanding and shaping the different understandings and concepts of sustainable development, as the next chapter discusses in more detail.

1.3 Sustainability: When did we start talking about it?

In 1713, Saxony’s chief mining officer, Hans Carl von Carlowitz, demonstrated the necessity and possibility of “sustainable forestry” in a book entitled *Sylvicultura oeconomica, oder hauswirthliche Nachricht und Naturmässige Anweisung zur wilden Baum-Zucht* (*Sylvicultura oeconomica, A Guide to the Cultivation of Native Wild Trees*). Another sustainability pioneer was Duchess Anna Amalia, the mother of Duke Carl August. In the late 1700s, she initiated the world’s first forestry reform, which was aimed at ensuring a continuous and steady supply of timber. At that time, Europe had an insatiable appetite for *materia prima*, or raw materials needed for building ships and houses, and for cooking and heating. This demand threatened to deplete resources and endanger their long-term survival.

In the 18th century, scholars in Germany as well as in other parts of Europe addressed the finite nature of natural resources. Unlike von Carlowitz, however, no one spoke

about sustainability. One important aspect was the provision of food for a growing population. Before industrialization, economic growth was largely determined by nature as a factor of production, such as the number of mines or ships built, or the amount of land available for farming. However, Thomas Robert Malthus, a British economist, warned that food production would not be able to keep up with the rapid population growth following the Industrial Revolution. Malthus believed that the population would grow at an exponential rate, while food production would increase at a linear rate. Although Malthus's thesis did not come true in the dramatic way he predicted, his work is often regarded as the first systematic treatise on the limits to growth in a finite world.

For a time, Malthus's ideas fell out of favour, as unlimited growth seemed possible due to the Industrial Revolution and the rise of capitalism. Talk of natural limits didn't resurface until the mid-20th century, when a "neo-Malthusian" perspective re-emerged in the context of the Club of Rome (founded in 1968), debates on planetary boundaries, and critiques of growth. While Malthusianism traditionally focuses on external, physical limits to growth, the ecological economist, Giorgos Kallis, proposes a different approach. Kallis (2019) advocates personal moderation and voluntary restraint, an approach to life that has deep roots in Romanticism and ancient Greek philosophy. He argues for an inner limit to our wants, to free us from the economic assumption of scarcity and the associated obsession with growth. While acknowledging the reality of external limits, Kallis believes they should not dominate the environmental argument against limitless growth. Kallis therefore asks whether it makes sense to frame climate change primarily as a problem of external limits, of scarcity, or of a finite atmosphere that cannot absorb any more of our emissions.

In the Malthusian logic, we would have to ever increase our production to meet the needs of a world with limits. As long as this mindset persists, the focus is on how we can exceed those limits, and how we can push the capacity of the climate to absorb a growing population and its demands.

1.3.1 The clash of economy and ecology

Originally, sustainability was a principle of resource economics that combined the economic goal of maximizing long-term forest use with ecological conditions for regrowth. In the 19th century, the concept of an 'eternal forest' emerged with the aim of putting an end to overexploitation and ensuring a long-term supply of wood, a vital raw material. Forestry scientists such as Heinrich Cotta developed mathematical methods for calculating timber stocks and growth. Over time, however, the focus shifted towards the pure yield theory, which focused on short rotation periods, high-yield monocultures and maximizing financial benefits. The focus was suddenly on the highest possible direct cash yield instead of a steady high timber yield. Natural cycles were replaced by capitalist dynamics; exchange value took precedence over utility value. This devalued the guiding principle of sustainability, and it took over a hundred years, until the 1960s and 70s, for the scientific disciplines of ecology and sustainability to regain prominence.

1.3.2 Club of Rome and The Limits to Growth

"If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the

limits to growth on this planet will be reached sometime within the next one hundred years.” Meadows et al. (1972), p. 23

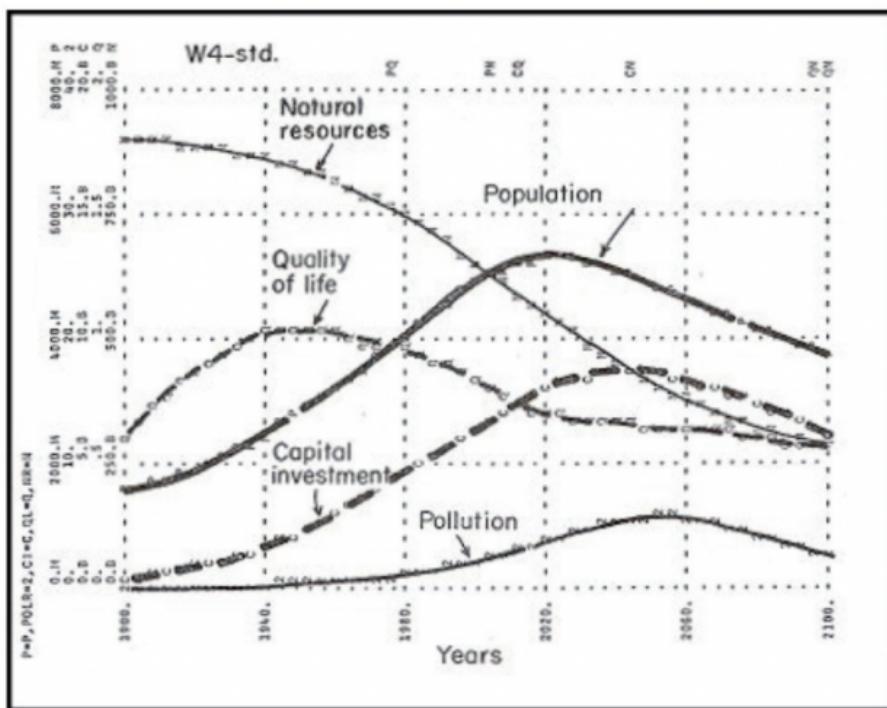


Figure 1.5: The “Basic model” of the simulation carried out at MIT, published in the autumn of 1970. Source: <https://donellameadows.org/>.

In 1972, the Club of Rome published a report, *The Limits to Growth*, which introduced a much broader understanding of “sustainability”. Scientists begin to call for a global state of equilibrium, or homeostasis, that would only be possible through coordinated international action. They integrate economic, ecological, and social aspects of sustainability and use the model of the dynamics of complex systems (“system dynamics”) to understand the world. They take into account the interactions between population density, food resources, energy, materials, capital, environmental degradation, and land use. Computer simulations of different scenarios show similar results: a catastrophic decline in the world’s population and living standards within 50 to 100 years, if current trends continue. The problem with the resource- and emission-intensive industrialized societies is that growth is not linear but exponential. In the long run, this kind of growth leads to collapse. And ecological collapse can only be prevented through a course correction, argued the report.

The *Meadows Report*, as it is also known, was heavily criticized for its predictions and methods. Some critics argued that the system dynamics model was too simplistic and failed to consider important factors such as technology and innovation. Others said insufficient account was taken of human adaptability and the possibility of political solutions and change. Others yet criticized what they called a Malthusian outlook and

a pessimistic view of the future. Despite these criticisms, however, the report sparked an important debate about sustainability and the need to protect the environment.

A year later, E.F. Schumacher published *Small is Beautiful: Economics as if People Mattered* (1973). Schumacher challenged the prevailing notion of limitless economic growth and technological progress. Instead, he advocated for a sustainable, human-centred economy that respects local communities and the environment. Schumacher argued that a decentralized economy, based on human values, not just profit, would create a better future for all. He also emphasized the importance of education and cultural development in creating a sustainable society.

1.4 From the development debate to the sustainability debate

Worsening air and water pollution helped raise the profile of environmental issues in politics and the media. Greenpeace was founded in 1971. In the 1960s and 1970s, Paul Crutzen and his research team studied the impact of nitrogen oxides on the ozone layer, predicting that this layer would be greatly depleted by human-made CFCs. The use of CFCs in refrigerators and air conditioners was subsequently banned. In response to the growing importance of environmental issues, the United Nations organized the first ever major environmental conference in Stockholm in 1972. The United Nations Conference on the Human Environment, as it was called, led to the creation of the United Nations Environment Programme (UNEP) and independent environment ministries in many countries.



Figure 1.6: Demonstration against air pollution, Zurich, December 1986. Source: Schweizerisches Sozialarchiv/Gertrud Vogler.

The emergence of environmental problems in the 1970s and 1980s coincided with the first “development crises” after the Second World War. In those days we still spoke of

“underdeveloped countries”. Following the success of the Marshall Plan in rebuilding Europe after World War II, it was assumed that similar programmes, such as a Marshall Plan for Africa, would lead to a rapid catch-up in socio-economic development of the poor countries of the Global South. But the 70s and 80s proved otherwise. Even exemplary countries such as Mexico and Brazil succumbed to debt crises, demonstrating that achieving socio-economic development and overcoming poverty were far more complex challenges.

From then on, it was clear that issues related to development and the environment had to be considered together at the intergovernmental level. In 1983, the United Nations set up a World Commission on Environment and Development, chaired by the Norwegian Prime Minister, Gro Harlem Brundtland.

1.4.1 Brundtland Commission

Gro Harlem Brundtland appointed 22 commission members, ¾ of whom were from the Global South. During this time, the Soviet Union, facing economic stagnation, was beginning to change political course. As the arms race with the US had contributed to a substantial budget deficit, Mikhail Gorbachev, the newly appointed General Secretary of the Communist Party of the Soviet Union, introduced major reforms. At the same time, a new world view and global consciousness were starting to emerge. It was against this background that the Brundtland Commission was tasked with drawing up a report on the perspective of global, sustainable, environmentally friendly development up to and beyond the year 2000. The report presented in 1987 was entitled *Our Common Future*, but it's often referred to as the *Brundtland Report*.

The Brundtland Report found that global environmental problems were mainly due to unsustainable consumption and production patterns in the North and severe poverty in the South. The overexploitation of nature and depletion of natural resources were exacerbating inequalities (of income and wealth), increasing absolute poverty, and posing a threat to peace and security. The Report sought to develop a fair and just definition of sustainability:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” (WCED 1987)

This definition introduced an ethical perspective into the sustainability debate, placing the principle of responsibility at the centre for both present and future generations. By focusing on human needs, the Brundtland Commission adopted an anthropocentric position. The Brundtland Commission identified three key principles for analysing problems and guiding action: a global perspective, the interconnectedness of environment and development, and the pursuit of justice, or equity. The concept of justice/equity was further divided into two distinct perspectives:

1. The intergenerational perspective: Responsibility for future generations.
2. The intragenerational perspective: Responsibility for people living today, particularly in developing countries, and ensuring equity within countries.

Sustainability and sustainable development

The concepts of “sustainability” and “sustainable development” differ in focus. Sustainability is static; it emphasizes a consistent state, while sustainable development is the dynamic process of achieving that state, implying movement and referring to something that is emerging.

1.5 From Rio 1992 to today

After the Brundtland Report’s call for international action, the focus turned to translating demands and proposals into binding treaties and conventions. The UN chose a conference as an instrument for this, and it was held exactly 20 years after 1972 Stockholm Conference, the first global environmental conference. The UN Conference on Environment and Development held in Rio de Janeiro, Brazil, in June 1992 – also known as the Earth Summit – was the largest international conference to date, with delegates from over 170 nations.

The Rio Earth Summit adopted the following five documents:

- A Forest Declaration, aimed at the ecological management and protection of the world’s forests;
- A Climate Protection Convention committing states to reducing greenhouse gas emissions worldwide to 1990 levels;
- A Biodiversity Convention to combat the decline in biodiversity through steps that are binding under international law;
- The Rio Declaration on Environment and Development; and • Agenda 21, the best known of the five agreements, according to which national governments are responsible for implementing the sustainability model in their countries.

The Rio Declaration on Environment and Development emphasizes that long-term economic progress is only possible using an ecosystem approach. This, in turn, requires a new and equitable global partnership among governments, people, and key societal groups. To achieve this, international agreements are necessary to protect the environment and the development system. The Rio Declaration established key principles of sustainable development, including precaution and polluter pays. For example, Principle 15 states: “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation”. (UN 1992)

In December 1992, the Commission on Sustainable Development (CSD) was established to ensure effective follow-up of the Summit.

1.5.1 Agenda 21: Think globally – act locally

Agenda 21, which contains 40 chapters, addresses all critical policy areas and actions for sustainable development. According to the Preamble, “...integration of environ-

ment and development concerns and greater attention to them will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future. No nation can achieve this on its own; but together we can – in a global partnership for sustainable development.” (UN CSD, 1992)

1.5.2 The Millenium Development Goals (MDGs)

The core principles of Agenda 21 – empowering women, protecting the environment, and promoting an equitable and inclusive society – laid the foundation for the Millennium Development Goals (MDGs) . Adopted by the UN in 2000, the MDGs comprised eight specific goals to be achieved by 2015. Although not all of these goals were met, the MDGs raised significant awareness of the need for sustainable development. The MDGs were succeeded by the Sustainable Development Goals (SDGs), which were adopted by the UN in 2015.

1.5.3 Rio+20

The UN Conference on Sustainable Development, or Rio+20, was held in Rio de Janeiro in 2012, 20 years after the historic 1992 Earth Summit that adopted Agenda 21. The main objective of Rio+20 was to reaffirm global political commitment to sustainable development. Participants, including government leaders and NGO and private sector representatives, discussed a wide range of issues, including poverty eradication , environmental protection, sustainable energy, food security, and resource management. The Summit’s key outcome was the adoption of a declaration entitled “The Future We Want”. This declaration renewed the international community’s commitment to sustainable development and to the Rio Principles and past action plans , and outlined further measures to achieve these goals. In addition, Rio +20 paved the way for a universal development framework to define global sustainability goals and priorities beyond 2015.

1.5.4 The 2030 Agenda and the Sustainable Development Goals (SDGs)

“We are the first generation that can put an end to poverty and we are the last generation that can put an end to climate change, so we [must] address climate change.” Ban-Ki Moon, UN Secretary General 2007–2016, on the 2030 Agenda

Rio +20 laid the foundation for the 2030 Agenda, which the UN adopted in 2015. The 2030 Agenda builds on the results of Rio+20 and sets out a comprehensive framework for sustainable development. The 2030 Agenda is based on five key principles or pillars (the 5 Ps) and introduces the 17 Sustainable Development Goals (SDGs), which aim to create a sustainable and just world by 2030.

The 5 Ps of the SDGs

The 5 Ps represent five key principles of sustainability : People, Planet, Prosperity, Peace, and Partnership.

People: This P stands for the aim to promote social justice, equal opportunities, good health, and education for all people. It also seeks to end poverty, promote gender equality, and improve people's well-being.

Planet: The aim of this P is to protect natural resources and to use them sustainably, to preserve biodiversity, to protect the climate, and to reduce pollution. Overall, it seeks to preserve our planet and promote sustainable environmental practices.

Prosperity: This refers to economic growth, sustainable production and consumption patterns, and the creation of jobs and economic prosperity for all. This P aims to promote a strong and sustainable economy that benefits all people.

Peace: This is about promoting peace, justice, good governance, and strong institutions. It's also about preventing conflict, reducing violence, and building inclusive societies.

Partnership: This refers to the importance of global cooperation, partnerships, and solidarity among all stakeholders. It's about working together to implement the 2030 Agenda, and sharing resources, experience, and knowledge.

1.5.5 2015 Paris Climate Agreement

The Paris Climate Agreement of 2015 is a landmark international agreement adopted at the 21st Conference of the Parties (COP 21) to the UN Framework Convention on Climate Change (UNFCCC) in Paris. The Agreement aims to limit the global temperature rise to well below 2 degrees Celsius compared to pre-industrial levels, and to endeavour to limit it to 1.5 degrees Celsius. The Paris Agreement is based on the principle of common but differentiated responsibilities and respect for national circumstances. It encourages all countries to take action to reduce their greenhouse gas emissions and to set themselves voluntary climate targets, known as Nationally Determined Contributions (NDCs).

The 2015 Paris Climate Agreement applies to every country that has ratified it, including Switzerland . As a Party to the Agreement, Switzerland has committed to contributing to the global reduction of greenhouse gas emissions and to implementing the Agreement's objectives.

1.5.6 Conclusion – there is progress, but it's too slow

While there has been some progress in institutionalizing and disseminating sustainability approaches in business, policymaking, and other areas, a large number of studies show that the world as a whole is on an unsustainable course (see the [Voluntary National Review of Switzerland 2022](#)). A similar picture is painted by various studies on the global environmental situation, such as UNEP's Global Environment Outlook 5 (GEO-5) published in 2012, the 2010 Millennium Development Goals Report (MDGs Report 2010), and reports on the 2030 Agenda and climate change (IPCC 2022). As

these studies show, the international community is a long way from sustainable, inter-generationally equitable ecological, social, and economic development.

For example, international climate policies have not stopped the rise in CO₂ emissions, the main cause of human-induced climate change, which have risen by around 50% since 1990. Species loss continues to accelerate in many places. The global fight against poverty falls short of the desired goals, and economic globalization over the past three decades has worsened socio-economic inequality in many countries, often linked to sociopolitical and sociocultural disparities.

1.6 The guiding principle of sustainable development as a normative concept

Turning the concept of sustainability into action and developing implementation strategies is a major challenge for our society. There are different understandings and concepts of sustainability and sustainable development, with no consensus on how to achieve sustainability and which measures to prioritize. Some of these understandings are presented below. The diversity of approaches reflects the different perspectives and interests of different stakeholders. To navigate this complexity, we need to reconcile economic, social, and environmental considerations. This requires an integrative approach. The challenge is to define common goals and develop strategies to achieve sustainability at all levels – global, national, regional, and local. We need broad societal participation and dialogue and cooperation between governments, business, civil society, and research institutions, to find solutions and drive the necessary change.

“When powerful metaphors become fashionable buzzwords, we risk that diversity is accompanied by vagueness, i.e. the phenomenon of a term that has several meanings that ‘have so much in common that it is difficult to separate them’ ” (Strunz 2012: 113 as cited in Feola 2015: 377).

The concept of sustainability usually has a positive connotation, but it can be viewed from different perspectives. In order to function as a guiding principle (in an ecological, social, and economic sense), it requires clear criteria. But what grounds can we use to define these criteria?

According to Hirsch Hadorn & Brun (2007), “sustainable development” should:

- Fulfil *needs*...
- ...in a *just* way,
- ...with a view to people living today and in the future, and
- taking into account the diversity of values and the limits to which nature can be used.

The guiding principle of sustainable development is therefore not only the result of scientific research, but is first and foremost a normative, ethically based concept. It brings together “ethical and analytical ideas” and formulates “norms that express what

is desirable and what should happen” (Renn et al. 2007: 39). As a result, sustainable development is a social process of negotiation and decision-making – of searching, learning, and gaining experience – that is guided by ethical considerations. Accordingly, sustainability research must always be aware of its involvement in social processes of perception and evaluation.

1.6.1 What values and norms should we be guided by, and why?

Moving from the concept of sustainable development to its implementation, ethics come into play. Ethics provide evaluation criteria, methodological procedures, or principles for “justifying and criticizing rules of action or normative statements about how we should act” (Fenner 2008, p. 5). Ethics also help to structure and justify complex decisions that arise in dilemma situations. In contrast to problems with single solutions, a dilemma is more complex and involves trade-offs and the weighing up of different options for action. Ethics provide orientation and decision-making structures that provide a framework for finding a suitable course of action in such situations. The core function of ethics is therefore not to solve monocausal problems, but to structure and categorize complex dilemmas.

Put simply, “morality” refers to personal or social beliefs about right and wrong, while “ethics” is the philosophical study of these beliefs. Ethics studies the rules and principles that “ought” to govern human behaviour. Ethics can be divided into general and applied ethics (Figure 1.7).

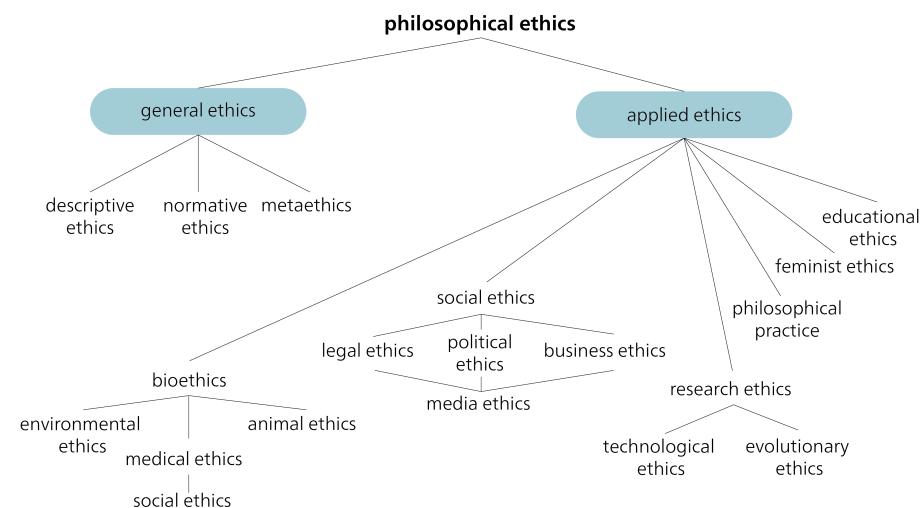


Figure 1.7: The different branches of philosophical ethics. Source: Own illustration based on Pieper and Thurnherr 1998: 9.

General ethics provides us with methods and concepts to discuss fundamental moral problems. It consists of three branches: normative ethics, descriptive ethics, and metaethics. Normative ethics focuses on determining what is morally right or wrong.

For example, questions about what constitutes a good life can have different answers, depending on people's individual values.

For this reason, normative ethics is further divided into teleological and deontological approaches. Teleological ethics (rooted in telos, the Greek word for "end", "purpose", or "goal") evaluates actions based on the good they produce. Utilitarianism, for example, is a teleological theory that evaluates actions based on the resulting utility or happiness. One of the first systematic elaborations of utilitarianism is Jeremy Bentham's (1748–1832) *An Introduction to the Principles of Morals and Legislation* (1780). Deontological ethics, on the other hand, evaluates actions on the basis of their characteristics rather than their consequences. Its root is deon, Greek for "duty". An example of a deontological ethical theory is Kantian ethics, developed by the German philosopher Immanuel Kant.

The distinction between teleological and deontological approaches is often discussed using the "trolley problem" (see Sandel [2009; 2013] for further reading).

Further reading

Justice: What's The Right Thing To Do? Episode 01 "THE MORAL SIDE OF MURDER." 2009. With Michael Sandel. The Moral Side of Murder. <https://www.youtube.com/watch?v=kBdfcR-8hEY>.

Sandel, Michael. 2013. *Gerechtigkeit*. Ullstein.

1.6.2 The imperative of responsibility – Hans Jonas

Hans Jonas's "imperative of responsibility" (1979) offers an important contribution to the sustainability debate by emphasizing our ethical responsibility for future generations and for nature. Jonas's approach, which has been described as a kind of "ethics of the future", aims to address the new challenges posed specifically by a technological civilization. The link to sustainability ethics lies in his understanding of the concept of ethical responsibility towards future generations, which he views as an asymmetric, non-reciprocal relationship (Jonas 1987a, p. 177). The asymmetry is derived from the power of a "moral subject" over someone or something that requires care; Jonas describes the vulnerability of life (ontological vulnerability) and responsibility as our duty of care to protect other beings from harm (Jonas 1987a, p. 391).

Jonas's approach differs from other ethical theories in that it doesn't take the existence of humanity for granted, and instead includes duties towards future generations as well as to nature. Jonas argues that the first duty of ethics of the future consists in recognizing the distant effects of human action (Jonas 1987a, p. 64). Given the uncertainty about the long-term consequences of human action, he proposes a decision-making principle based on the Latin term, *in dubio pro malo*, which he interprets to mean: "[...] when in doubt, give the worse prognosis precedence over the better, as the stakes have become too high for the game" (Jonas 1987b, p. 67). Jonas thus develops a new categorical imperative, emphasizing the need to preserve both nature and humanity. It is based on the idea that nature has inherent value and purpose: "Act in such a way that the effects of your action are contractual with the permanence of genuine human life on earth", or "Act in such a way that the effects of your action are not destructive to the future possibilities of such life" (Jonas 1987a, p. 36).

Already in the late 1970s, therefore, Hans Jonas articulated a fundamental uncertainty about the risks and harm that could arise for future generations from the technologies that were being used, such as nuclear energy. Decision-making around issues such as new technologies requires a continuous evaluation of risks and opportunities, often amid incomplete information and uncertain future forecasts. These choices not only impact the environment, but also raise ethical questions about our obligation to ensure sustainability for future generations. Jonas's imperative of responsibility emphasizes the link between responsibility and duty as key concepts in the sustainability debate. According to Jonas, current generations have a forward-looking responsibility to future generations. He leaves open, however, the extent of this duty, and whether future generations are entitled to absolute or comparative standards.

Jonas's imperative of responsibility can be considered in connection with various areas of responsibility that represent different ethical approaches: anthropocentrism, pathocentrism, biocentrism, and physiocentrism.

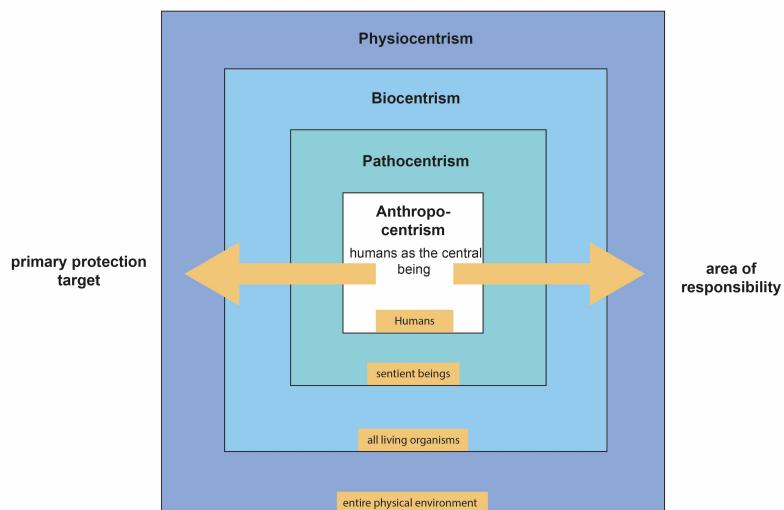


Figure 1.8: Different ethical approaches. Source: Own illustration based on Carnau 2011: 143.

Anthropocentrism views humans as the central beings, emphasizing responsibility towards human society and its well-being. This includes considering the needs and interests of both present and future generations. Pathocentrism, on the other hand, emphasizes responsibility towards sentient beings and their well-being. It recognizes that not only humans, but also animals and other living beings, have the right to be free from suffering and harm. Biocentrism, in turn, recognizes the intrinsic value of all living organisms and focuses on the protection and preservation of biodiversity. It emphasizes the importance of respecting the natural environment and promoting sustainable practices. Finally, physiocentrism focuses on the responsibility towards the entire physical environment, including inanimate nature and ecosystems. It recognizes the intrinsic value of nature and emphasizes the complex interactions between all components of the ecosystem.

Hans Jonas's imperative of responsibility reconciles all of these different areas of responsibility. It urges us to take responsibility for people as well as for other living beings, nature, and the environment. In doing so, it is important to adopt a balanced and comprehensive perspective that takes into account long-term effects and the well-being of all.

By integrating these different areas of responsibility, we can cultivate a holistic and sustainable ethic that takes due account of the needs and interests of all aspects of life and nature.

1.7 Sustainable Development in the context of development debates

Is “sustainable development” a development theory? Yes and no. No, because sustainable development is a broader social model and acts as an overarching framework that encompasses various development theories. Yes, because sustainable development is a normative theory that de facto competes in scientific and social practice with other theories of social and, in particular, socio-economic development.

Development theories analyse social development, either retrospectively or prospectively, and either as a whole or through specific aspects (e.g. economic development). The retrospective study of social development seeks to explain past or current social developments and to draw lessons for future planning and development policy. The prospective study of social development aims to inform social development management and policy. Development theories can be categorized into different types: normative, strategic, and explanatory theories. Each type focuses on different aspects and objectives of development research.

Normative theories focus on the question of what development should look like, and what normative goals it should achieve. They examine values and goals associated with development, often referring to concepts such as social justice, sustainability, or poverty alleviation. Normative theories emphasize the definition of criteria for good development, and provide a normative framework for policy decisions and measures. Examples include the theory of sustainable development, John Rawls's theory of social justice, or Amartya Sen's Capability approach.

Strategic theories investigate which strategies and measures are needed to achieve desired development outcomes. They focus on questions of policy design, resource allocation, and the implementation of measures, analysing how specific approaches, such as neoclassical growth theory, can promote development.

Explanatory theories aim to explain the causes and mechanisms of development. They analyse factors that drive development processes in societies and study the links between the different variables. This involves examining economic, social, political, or cultural factors to identify patterns and connections. Examples include modernization theory and dependency theory.

Note: All theories are based on normative foundations – i.e. underlying values and beliefs – and therefore imply, even unintentionally, certain ideas about how society should develop.

1.7. SUSTAINABLE DEVELOPMENT IN THE CONTEXT OF DEVELOPMENT DEBATES 27

Table 1.1: Overview of Development Debates. Source: Extended table based on Egli et al. (2022), p. 378

	1950s/60s	1970s	1980s	1990s	Since 2008
Narrative	economic growth, modernization, and integration into the world economy	Fight against extreme poverty and inequality	Lost decade: collapse of commodity prices; increase in debt	Sustainable development; decade of hope	Polycrisis
Basic idea	Catch-up development through industrialization and large-scale projects	Satisfaction of basic needs, growth, and effective distribution	Overcoming the debt crisis through structural adjustment measures, reduction of state services	Global and sustainable environmental policy, economic growth, peacekeeping, continuing basic needs strategy, participation	Bringing together various crisis phenomena (financial crisis, climate change, biodiversity crisis, etc.) and examining their complex interrelations; search for integrated solutions
Theory	Modernization theories (stage theories)	Dependent theories versus modernization theories	Market liberalism and neoliberalism	- Theories of sustainable development - Neoclassical growth theory - Postcolonial theories - Capability approach - Post-development theories	Additional resilience theories, post-growth theories

	1950s/60s	1970s	1980s	1990s	Since 2008
Goals	Geopolitical classification of the “Third World”; containment of communism, modernization of agriculture, rapid industrialization and technological progress, opening up of new markets	Aid for self-help, appropriate technologies, rural development, promotion of women	Increase in exports, balanced state budgets	Paradigm shift in development aid towards development cooperation, environmental and social compatibility of development, ensuring access to resources and infrastructure for all	
Consequences	dependence and indebtedness increase, income disparities widen, poverty rises, ecological damage due to overuse and inappropriate technologies, undemocratic regimes are supported for geopolitical reasons	Selective progress in education and health, problems of debt and environmental damage	Living standards of the poorest population deteriorate severely, environmental exploitation, debt spiral, increase of dependency of the Global South on Global North countries	Focus shifts from purely economic development to human development; industrialized countries are obliged to implement sustainable development; emergence of a global development partnership	

Development theories

Modernization theory (1950s–1980s) emphasizes the transition from traditional societies to modern, industrialized societies as the basis for development. For proponents of modernization theory, the countries of the Global South are developing in the same direction as industrialized countries, but at a much slower pace. Modernization theory values economic growth, technological progress, and institutional adjustments. It is often associated with stage theories, which emerged in the 1950s and 1960s. Stage theories view development as a gradual process characterized by clearly defined stages or phases of development, with emphasis on economic growth and modernization. Prominent proponents include Walt Rostow, who identified five stages of development in his work, *The Stages of*

Economic Growth: A Non-Communist Manifesto (i.e. traditional society, pre-conditions for take-off, take-off, drive to maturity, and mass consumption).

Dependency theory (1970s and 1980s) emphasizes the structural dependence and inequality between developed and developing countries. It argues that developing countries are trapped in an unjust global economic system and remain dependent on developed countries.

Neoclassical growth theory (as of the 1990s) focuses on the connection between capital accumulation, technological progress, and economic growth. It emphasizes free markets, trade, and investment as drivers of development.

Postcolonial theories (as of the 1990s) emphasize the historical and structural inequality between former colonial powers and colonies. They argue that development can only be achieved through a critical examination of the legacy of colonialism.

Sen's Capability approach (as of the 1990s) emphasizes the importance of freedom, social justice, and human development. It emphasizes the necessity to improve the opportunities and capabilities of people in order to achieve development.

Post-development theories (as of the 1990s) criticize linear development models that impose Western ideas of progress, emphasizing instead local practices and values. Prominent thinkers in this field include Arturo Escobar, who critically reflects on the idea of development in his work Encountering Development: The Making and Unmaking of the Third World, and Vandana Shiva, whose Decolonizing the North calls for a sustainable and fairer development policy in the Global South that reduces the influence of the Global North.

1.8 Sustainability models

1.8.1 Three dimensions of sustainability

The established three-sector model of sustainability, introduced in the 1987 Brundtland Report, seeks to balance environmental, economic, and social concerns. This model, which later also became known as the “triple bottom line” model, emphasized that economic development should be profitable while ensuring that environmental and social impacts remain neutral. On closer inspection, however, the model – initially depicted as a building with three pillars – has a major weakness. While it was intended to suggest that if any one pillar was weak, the system as a whole would be unsustainable - it could be argued that removing one of the pillars – or even the two outer pillars – would not make the building collapse if the remaining pillar(s) were strong enough. Despite its widespread use and overall success, the model struggles with transparency and equity. For example, measuring economic success requires quantitative indicators, while it’s hard to find similar metrics for social well-being, especially emotional aspects. Some critics argue that the model prioritizes conventional economic thinking, neglecting important social aspects. An overemphasis on human economic systems can also prevent us from seeing our dependence on non-human ecological systems.

1.8.2 Sustainability as an intersection

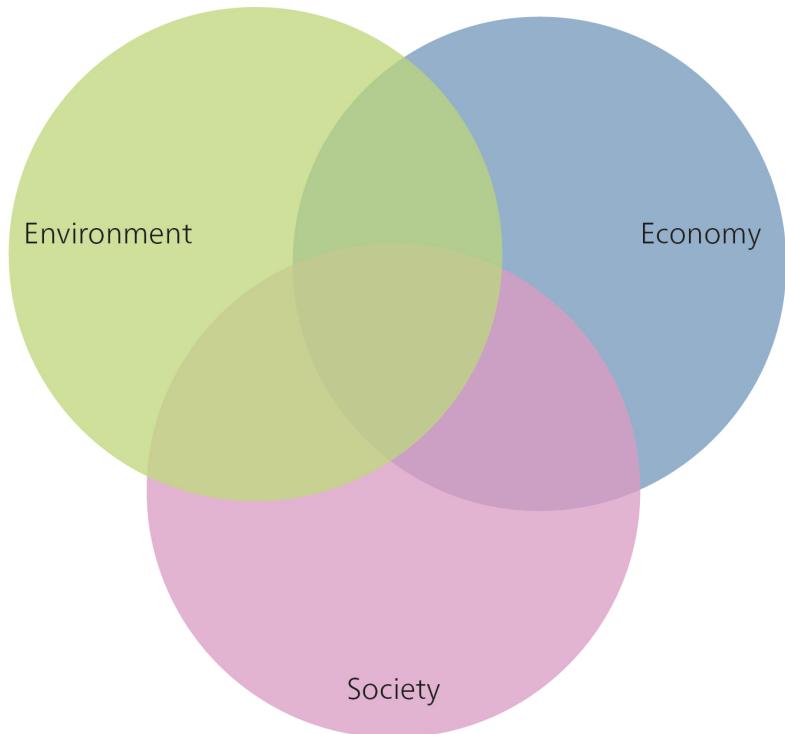


Figure 1.9: Sustainability as an intersection. Source: Own illustration.

A model displaying the three sectors as a Venn diagram (overlapping rings or circles, sometimes known as the intersection or triad model) offers an alternative to the separate pillars, emphasizing the interconnectedness of the three dimensions. This model illustrates that there can be a closer connection between two areas, and that the boundaries are fluid.

1.8.3 Nested sustainable development

Giddings et al. (2002) challenge the idea of separate spheres for the economy, society, and environment. They propose a “nested” model, where the economy is seen as part of society, which in turn is embedded in the environment. This model, they argue, ensures that economic decisions are always constrained by social and environmental factors. Global ecosystems form the basis for social systems (i.e. society). Embedded therein is the economy, which serves society’s needs. A potential drawback of this model, however, is that if the economy is the starting point for all sustainability considerations, there’s a risk of prioritizing it over social and environmental considerations.”

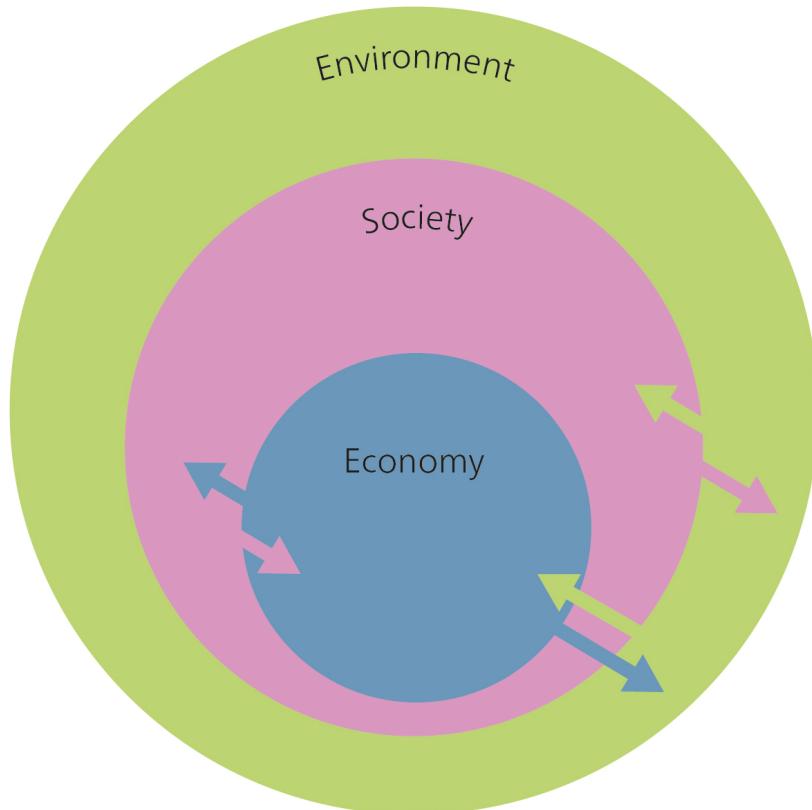


Figure 1.10: The nested model of sustainability. Source: Own illustration adapted from Giddings (2002: 192).

1.8.4 A four-dimensional model of sustainability

One problem with the three-sector model of sustainability is that it's unclear what falls within the broad "social" sphere. It has therefore been suggested that a fourth dimension be added, to emphasize certain aspects that might otherwise remain hidden in the social sector. For example, Jon Hawkes, an Australian cultural commentator, has suggested adding "cultural vitality" as a fourth pillar of sustainability, in addition to environmental, economic, and social concerns.

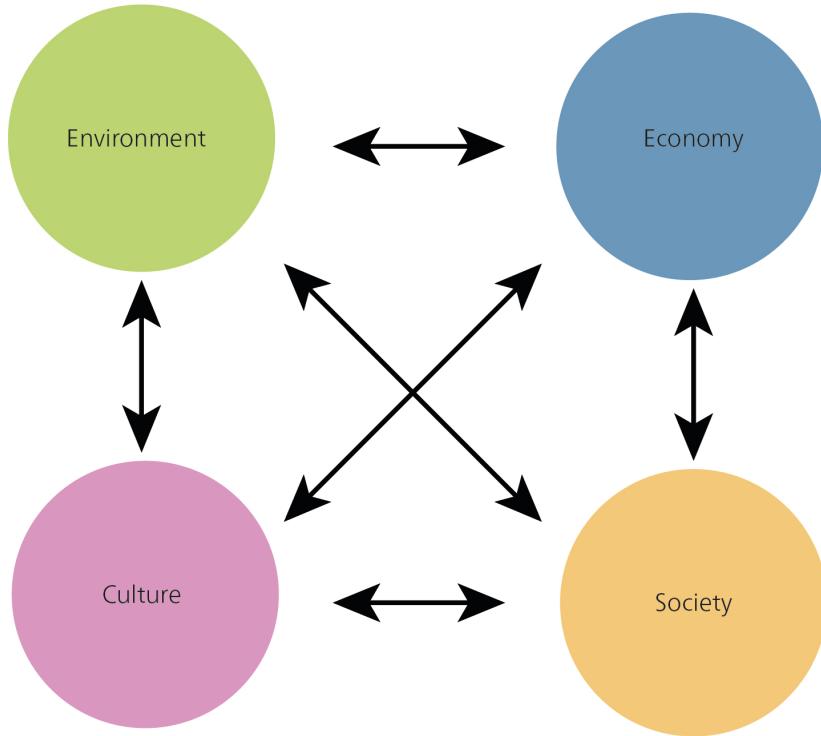


Figure 1.11: Four-dimensional model of sustainability. Source: Own illustration, adapted from Hawkes, 2004.

Cultural sustainability is often seen as a part of social sustainability. Sometimes the term “sociocultural sustainability” is also used. In this context, “culture” refers to aspects such as equity, opportunities for participation, awareness of sustainability, and general operating and behavioural models (Murphy, 2017). It’s clear that the social and cultural dimensions are closely linked. Cultural processes influence our social lives and how we view social sustainability, like the value we place on equality as a social goal. In turn, social structures and institutions influence cultural practices and judgements. Despite this strong connection, cultural and social sustainability can also be seen as separate dimensions or perspectives of sustainability.

Culture does not have its own Sustainable Development Goal (SDG). In the 2030 Agenda, culture is mentioned in relation to “civilization”, “diversity”, “interculturality”, “cultural heritage”, and “tourism”, under the following four SDGs: quality education (SDG 4), decent work and economic growth (SDG 8), sustainable cities and communities (SDG 11), and responsible consumption and production (SDG 12) (Duxbury et al., 2017).

The concept of cultural sustainability can be interpreted in different ways: as the fourth dimension of sustainability, as culture for sustainability, and as culture as sustainability. The interpretation of “culture as sustainability” requires a new way of thinking and a new paradigm in relation to sustainability. In this view, culture itself is transformed to-

wards sustainability. Cultural sustainability here means thinking about what needs to be preserved, what needs to change, and how we can implement these changes. This interpretation – viewing culture as sustainable development – defines culture in the broadest sense as a comprehensive lifestyle and a continuously changing process. Our social order (such as capitalism and democracy), our values, and our ways of working are all cultural products. Culture thus encompasses all the other dimensions of sustainability and transforming it becomes a key concern or paradigm for sustainability.

The definition of cultural sustainability contains several important aspects: Firstly, it emphasizes the importance of intellectual growth and responsibility. This means acquiring knowledge, developing a better understanding of important issues, and participating in educational activities and events. It also means acting not only as individuals, but also as members of different communities. All problematic and unsustainable structures and operating models have been created and developed by humans. We humans, therefore, also have the opportunity to change them.

Cultural sustainability is required, for example, for a “Great Transformation” as advocated by Uwe Schneidewind (2018). In his work, Schneidewind emphasizes the need for comprehensive change in all dimensions of society, including culture, in order to achieve sustainable development. Recognizing cultural sustainability as a central paradigm of sustainability supports the vision of a comprehensive transformation that goes beyond technological and economic solutions and strives for a fundamental societal change of course.

1.9 Weak and strong sustainability

The academic debate on sustainability distinguishes between weak and strong sustainability (see e.g. Ott, 2020). Neither concept can easily be dismissed, as both rely on assumptions that are difficult to refute. In practice, both concepts are considered partially true, with evidence both in favour and against. The key difference between weak and strong sustainability is the question of what we should sustain, and the degree to which what forms of capital can be substituted. This concerns, in particular, the following three forms of capital: natural capital, manufactured capital , and human capital.

Natural capital: the natural resources and ecosystems that are key to human well-being and sustainable development. These include land, water, air, biodiversity, and renewable energy. Natural capital is the basis for many economic activities, and it provides essential ecosystem services such as food, the purification of water and air, and cultural and aesthetic benefits.

Manufactured capital: the material resources and infrastructure used in production and economic activity. This includes buildings, machinery, technological equipment, means of transport, and physical infrastructure. Manufactured capital is closely linked to economic growth and productivity, and plays an important role in economic development.

Human capital: the knowledge, skills, level of education, health, and creative abilities of people in a society. It encompasses individual and collective knowledge as well as the skills needed for economic productivity and social progress. Human capital is important for innovation, labour productivity, social participation, and the ability of a society to tackle challenges and to adapt.

1.9.1 Weak sustainability

Weak sustainability can be considered the “soft” or flexible option. Supporters of weak sustainability believe that an action is sustainable if it offers an advantage to the overall system, or at least does not reduce its quality. Weak sustainability can therefore be seen as a basic requirement of sustainability, in that it aims to maintain a certain level of well-being/quality of life or to ensure equality. The concept of weak sustainability “assumes the extensive and, at least in principle, unlimited [...] substitutability of all types of capital” (Ott & Döring, 2004: 41) and is thus based on the premise of neoclassical economics. Proponents of weak sustainability believe that natural capital can be substituted with other forms of capital. They emphasize the concept of “total capital”, arguing that the specific make-up of the capital inherited by future generations is irrelevant, as long as overall benefits and well-being are sustained. This aligns with neoclassical utility theory, according to which it is irrelevant how utility is generated.

Weak sustainability supporters therefore believe that measures can be considered sustainable, even if they are carried out at the expense of natural capital – as long as this loss is compensated for by an increase in human or manufactured capital. This could justify the extraction of raw materials such as coal or excessive crude oil. And Carlowitz's Silvicultura oeconomica forest, could, in principle, also be replaceable or degradable, provided that its natural and cultural functions can be fulfilled in other ways by future generations. This understanding of sustainability emphasizes the importance of technological progress for sustainable development.

Evaluating measures based on weak sustainability is challenging, due to the inherent complexities and numerous assumptions involved. This goes beyond fundamental questions about sustainability, such as “What is a good life?”, or “How do we measure the level of well-being?”. A key challenge lies in assigning a monetary valuation to different types of capital, especially those lacking a clear market price. To operationalize this, what factors should be taken into account? What is the value of natural beauty? What is the value of a rare bird or a whale? Buller's *The Value of a Whale* (2022) impressively outlines the problems we face in trying to put a price on elements of nature.

Critics of the concept of weak sustainability point to several limitations. Firstly, they question the assumption that natural resources can be endlessly replaced by reproducible capital. Secondly, they doubt whether an increase in goods can truly compensate for the loss of environmental quality. Finally, concerns exist about our ability to develop new resources and the potential for exceeding critical threshold values. These criticisms have paved the way for the concept of “strong sustainability”.

1.9.2 Strong sustainability

In contrast to weak sustainability, strong sustainability emphasizes the preservation of natural capital. Proponents of this eco-centric theory are less optimistic about our ability to substitute natural resources with manufactured ones, believing these resource types to have limited interchangeability (Daly, 1990; 1999; Ott 2001, Ott & Döring 2004). They argue that the individual elements of natural capital should be kept as constant as possible, to prevent, for example, species extinction.

Table 1.2: Weak and Strong Sustainability. Source: Derived from Eblinghaus & Stickler 1998; Dobson 2002; Rieckmann 2004; Steurer 2001; Michelsen et al. 2016

	Very Weak CategorySustainability	Weak Sustainability	Strong Sustainability	Very Strong Sustainability
What should be pre- served?	Total capital	Essential natural capital	Non-renewable natural capital	Nature has its own value
Why?	Maximization of economic profit and individual welfare (GDP)	+ Limitation of environmental damage and resource scarcity	Ensuring long-term living conditions for humans and nature	+ Respect for all forms of life and duties toward nature
How? (Policies)	Growth orientation through promotion of technology and innovation	Environmental regulations, resource efficiency, renewable energies	+ Conservation measures, ecological restoration, sustainable agriculture	
Substitutability	Principle of unlimited, natural resources can be replaced by technology and trade	Partly possible, but limited substitutability of ecosystem services	Limited, critical threshold for environmental changes	Low, recognition of unique values and relationships
Ethics	Anthropocentric, short-term benefits take priority	Anthropocentric with stronger consideration of environmental interests	Pathocentrism, recognition of intrinsic value of nature	Biocentrism, ecological integrity, ethical responsibility toward nature

While neoclassical economists are confident about substitution, proponents of strong sustainability emphasize the importance of prevention and anticipation, rather than aftercare and reaction. For example, reacting to the hole in the ozone layer by using sun cream, protective clothing, or medical aftercare fails to tackle the cause of the problem. Similarly, technological approaches such as geo-engineering are criticized for merely treating problems superficially. Geo-engineering refers to technical interventions in geochemical or biogeochemical cycles, for example to slow down climate change or ocean acidification.

Until now, reducing pollution has mainly focused on end-of-pipe technologies, such as flue gas cleaning systems on factory chimneys or catalytic converters in cars. But this also meant that we put off tackling long-term environmental problems, such as climate change or biodiversity loss, as long as their effects were not immediately apparent. This phenomenon is linked to the concept of externalization, in which environmental and social costs are shifted outwards, as described by Lessenich (2018). This means

that pricing only takes into account the economic costs, partly because they are easier to quantify, while the social and environmental costs of providing goods and services are omitted or externalized, leading to distortions in market prices.

1.10 Sustainability strategies as principles of sustainable development

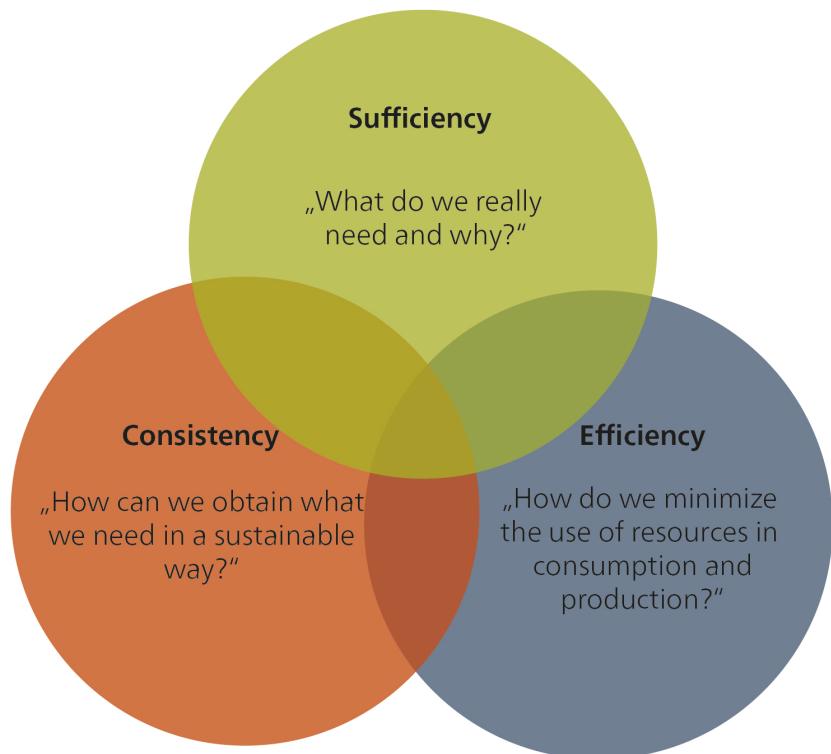


Figure 1.12: Sustainability strategies (Own illustration).

1.10.1 Efficiency strategy

The efficiency strategy focuses on minimizing resource use (i.e. raw materials and energy) in manufacturing or service provision. This translates to reducing material consumption (material intensity), energy consumption (energy intensity), and emissions of harmful substances such as CO₂. Also known as “eco-efficiency”, this strategy is attractive to business and society, as it can reduce costs, resource use, and environmental impact. Implementing the efficiency strategy starts with improving production processes, primarily through technological advancements. Proponents believe it's possible to double prosperity while halving natural resource use (Weizsäcker et al. 1995).

However, critics of the efficiency strategy are less optimistic, and caution against overestimating its impact on sustainable economic activity. They point to “rebound effects”, which can reduce or even wipe out the gains from efficiency increases (Paech 2012; Santarius 2014).

Putting Efficiency Strategies into Action: Examples

Energy-efficient lighting: Replacing conventional lightbulbs with energy-efficient LED bulbs lowers electricity use and helps reduce the demand for energy.

Fuel-efficient vehicles: The development of more fuel-efficient hybrid or electric vehicles can lead to lower fuel consumption and road transport emissions.

Efficient building technology: Installing smart HVAC (heating, ventilation, and air conditioning) systems in buildings helps to reduce energy consumption for heating and cooling.

Efficient water use: The use of water-saving fittings and systems in households and industrial companies reduces water consumption and minimizes waste.

1.10.2 Consistency strategy

While the efficiency strategy focuses on quantity (reducing resource use while achieving greater output), the consistency strategy (from the Latin con = together + sistere = to stop) strives to reconcile nature and technology by using resources repeatedly instead of only once. Instead of fossil fuel-based resources, products, and technologies, it seeks to use materials that are compatible with natural material cycles and processes. Also referred to as “eco-effectiveness”, this concept follows the principle of “cradle to cradle” rather than “cradle to grave”, and is based on the idea that intelligent systems generate only products, not waste. This can be achieved in two ways: Materials can either be biodegradable (e.g. a shampoo made with natural ingredients) or they can be designed with “technical nutrients” that remain in the technical cycle. This means that a disused product doesn’t end up in the rubbish, but instead enters the next cycle of use, for example through upcycling (e.g. reusing a computer casing or converting into, say, a shelving system). Like the efficiency strategy, the consistency strategy also starts by looking at how production processes can be optimized. Many believe that the consistency strategy has greater potential than the efficiency strategy, in terms of problem solving and achieving far-reaching changes.

However, critics believe the theory has limited applicability. For example, Gerolf Hanke and Benjamin West (2013) argue that it can’t be applied equally to every type of good, and that implementing technologies to achieve it would require significant investment in production facilities and logistics. They also note that recycling processes themselves are associated with increased energy consumption, in accordance with the law of entropy:

“Every material economic process results in an increase in entropy, i.e. roughly simplified, that the elements on the material level are distributed more and more evenly, which ultimately only means that things and bodies wear out and a new concentration requires an ever-increasing amount of energy.” Translated from Hanke and West (2013, p. X)

A special feature of the Earth's ecosystem is solar energy, which provides a constant supply of energy from the outside and counteracts the increase in entropy on Earth. But we still need what is known as "grey energy" to manufacture energy generation systems, e.g. biofuel systems, solar cells, electric car batteries, and wind turbines. Consistency strategies can incentivize industry to strive for a reduction in resource consumption and emissions.

Putting Consistency Strategies into Action: Examples

Renewable energy systems: The transition from fossil fuels to renewable energy sources such as solar energy, wind energy, and hydropower is an effort to align energy production with the natural rhythms and cycles of the environment.

Recyclable electronics: Designing electronic devices in a way that makes it easy to repair, upgrade and recycle them, in order to minimize resource consumption and environmental impact.

Sustainable construction: Constructing buildings using sustainable materials that have a low environmental impact and can be reused or recycled at the end of their useful life.

1.10.3 Sufficiency strategy

The concept of sufficiency, rooted in the Latin word *sufficere* (to suffice), challenges our assumptions about how much we need for a good life. It promotes a reduction in resource and energy consumption by focusing on decreasing demand for resource-intensive goods and services. Sufficiency, which could also be described as frugality or adequacy, is critical of the constant creation of new needs by technology and advertising amid a limited supply of natural resources. Sufficiency urges us not to chase after every newly created need, and to fulfil our needs without consumption. While efficiency and consistency strategies focus on production, sufficiency focuses on consumption, albeit not exclusively: sufficiency can be practised to varying degrees and at different levels, from small changes in behaviour (sharing instead of buying) to significant changes in lifestyle (giving up air travel). Although it starts at an individual level, sufficiency can be applied at various levels, such as by companies (sufficiency-oriented product design) and governments (sufficiency policies). Sufficiency therefore seeks the right balance: How much do we need for a good life? And what do we not need?

Critics believe the sufficiency strategy has only limited potential and is unlikely to find broad sociocultural acceptance. However, proponents see it as crucial for sustainability policy, especially where efficiency and consistency strategies fall short. The concept of a post-growth economy draws on the principles of the sufficiency strategy.

Putting Sufficiency Strategies into Action: Examples

Sharing and communal use: Platforms and initiatives for sharing objects, tools, or vehicles make it possible to use resources more efficiently and reduce the number of products manufactured.

Plant-based diet: Switching to a predominantly plant-based diet reduces resource consumption, e.g. of water and land, compared to meat production.

Reduction in working hours: A reduction in working hours can lead to a lower consumption of resources, as less energy and materials are required for the production of goods and services.

Local consumption: Supporting local producers and markets helps to reduce transport routes and emissions.

1.10.4 Rebound effects: The flipside of efficiency



“Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius — and a lot of courage to move in the opposite direction.” E.F. Schumacher (1973)

Figure 1.13: Rebound effect illustrated using the example of the automotive industry.

Source: [@fietsprofessor](#) on LinkedIn.

Critics of the efficiency principle warn of the rebound effect, also known as the Jevons paradox (Jevons 1865/1965). This phenomenon occurs when efficiency improvements lead to lower prices for goods and services, thus increasing demand and negating the initial benefits of lower resource use.

Take this simple example: If passenger cars become cheaper due to improvements in efficiency, then people may choose a larger model when they next purchase a car. In addition, a fuel-efficient car is cheaper to run, as it requires less fuel per kilometre. This usually incentivizes people to drive more (either by making more frequent journeys or travelling longer distances) and reduce their use of public transport or their bicycle. As a result, efficiency gains that are technically possible are often not realized in practice, as the product in question is used more frequently or more intensively. Apart from the direct change in the use of the product (direct rebound), there may be additional changes in consumer behaviour that affect the environment. In this example, this could mean that the money saved on purchasing or using the car is spent on air travel instead (indirect rebound), which in turn cancels out some of the environmental benefits.

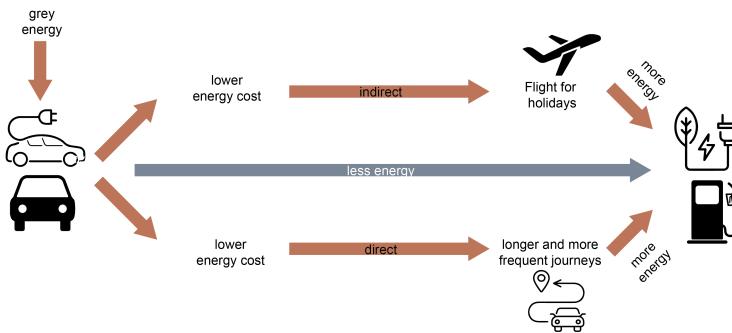


Figure 1.14: Indirect and direct rebound effects of energy-saving passenger cars (Own illustration).

To understand the rebound effect, the literature focuses on the following three areas: 1) financial factors, 2) socio-psychological influences, and 3) regulatory effects, which we analyse in more detail below.

1. Financial factors are a major cause of the rebound effect. When efficiency leads to cost savings, financial resources are freed up. This can lead to people either consuming more of the same product (direct rebound effect) or investing in alternative goods (indirect rebound effect). The financial rebound effect can be based on several factors, including:
 - The income effect: when efficiency leads to real income gains for consumers, it can result in a direct or indirect rebound effect.
 - The reinvestment effect: when companies use cost savings to expand their production or invest in other products.
 - The market price effect: the macroeconomic effect in which demand in one sector stimulates demand in other sectors. For example, as cars become more efficient, demand for fuel may fall, making fuel cheaper and affecting demand in other energy-consuming sectors.

The extent and intensity of the financial rebound effect depends on factors such as price elasticity and consumer behaviour. While this happens at the individual level, it can cumulate into a macroeconomic market price effect with far-reaching consequences.

2. Socio-psychological influences include the “mental accounting” of individual consumers. For example, consumers who have purchased an efficient product may “allow themselves” to consume more. This is why increases in the efficiency of products that were previously considered harmful to the environment can, paradoxically, lead to an increase in consumption. This direct rebound effect is often referred to in social psychology as the “moral hazard effect”. If the decision to increase consumption is not made rationally, this is known as the “moral leaking effect”. For example, if you drive more after buying a resource-efficient car, because the purchase alone is perceived as environmentally conscious. The

indirect rebound effect can also be attributed to socio-psychological factors. The “moral licensing effect” states that the purchase of resource-efficient products can lead to an increase in the consumption of other products that may be harmful to the environment. For example, when the purchase of a fuel-efficient car is used to justify more frequent air travel.

3. Sometimes, government regulations or incentives to promote efficient technologies can have unintended consequences – this is what we mean by the “regulatory effect”. For example, if people are encouraged to purchase large electrical appliances devices due to government incentives for energy-efficient models. Such incentives may result in more frequent purchases of appliances, which – even if the newer model is more efficient than the old – partially cancels out the energy-savings effect. Furthermore, the introduction of efficiency technologies leads to new capacities and infrastructures, which can result in the creation of new markets. Wind turbines, for example, promote the development of new infrastructures and jobs, but at the same time require considerable resources. In addition, consumers who purchase a more efficient product may not necessarily discard their old product. Some end up using both products, which can lead to increased overall consumption (Santarius, 2012).

Rebound-effects

The **direct rebound effect** occurs when improved energy efficiency makes it cheaper to consume a resource, leading people to consume more of it. For example, a more fuel-efficient car would be cheaper to run. This might encourage people to drive more, partially or completely cancelling out the energy savings from the efficiency increase.

The **indirect rebound effect** occurs when energy savings or resource efficiency gains in one area lead to the use of the freed-up resource in other area. This reduces the overall savings achieved. For example, if the money saved from more energy-efficient living is used instead for more frequent flying.

1.10.5 How big is the rebound effect?

It is difficult to know exactly how big the rebound effect is: empirical estimates vary widely, depending on the methods used and the effects taken into account. It is particularly challenging to clearly distinguish rebound effects from growth or structural changes. The type of products and services offered also influences the level of the rebound effect. For example: If a more economical means of transport is used for the daily commute, such as a more efficient car, costs fall, but the available time remains limited. Therefore, you cannot commute as often or for as long as you like, because there are only 24 hours in a day. The rebound effect is therefore relatively small in this case. The situation is different for leisure activities, such as travelling by air. If costs fall due to more efficient aircraft or cheaper prices, there is a greater incentive to fly more often — for example, taking a second weekend trip instead of just one per year. As time is not such a tight constraint here, additional consumption can increase significantly — as can the rebound effect. Another important component is the degree of saturation with goods and services. Observations show that rebound effects tend to

be lower in high-income countries than in developing countries, where there is still a considerable need for additional consumption.

For example, the direct rebound effects associated with improvements in space heating efficiency might lead to 10-30% less energy savings than what's technically possible (e.g. Hediger et al., 2018). The rebound effects of transport vary even more. According to Anderson et al. (2019), the rebound effect related to private mobility might reduce potential savings by 7.5% in Denmark, 30% in Sweden, and 60% in Germany. In contrast, studies on lighting in private households have found very low rebound effects of less than 10% (Sorrell, 2007). This means that the actual energy savings for these services can be, on average, up to 25% less than what is technically possible and predicted. However, the exact magnitude of the rebound depends on the specific context and can be reduced by choosing appropriate measures.

Sometimes, albeit rarely, the savings may be overcompensated. This is known as the “backfire” effect. However, this is an exception and the “backfire” effect is not a pure rebound effect, as it is linked to the effects of growth and structural change. A good example is digitalization, which can lead to short- and medium-term backfire effects (Peng et al., 2023).

Part II

Approaches to Sustainability

Chapter 2

Approaches to Sustainability

2.1 Approaches to Sustainable Development

Christoph Bader

The world is facing numerous challenges of sustainable development, including pressing environmental problems and social inequalities. Scientists, researchers, and activists are seeking innovative approaches to enable sustainable and equitable change. This chapter examines some of these approaches, which offer a complete rethink of current paradigms. Approaches discussed in this chapter:

- Planetary boundaries framework
- Doughnut economics
- Approaches to a “great transformation”
- Green economy
- Post-growth approaches
- Implementing the 2030 Agenda

2.2 Debates about planetary boundaries

In 1798, British economist Thomas Robert Malthus published his influential essay, *An Essay on the Principle of Population*. Malthus’s core idea was that population growth would surpass Earth’s ability to produce food, sparking a debate on planetary carrying capacity that continues today. *The Limits to Growth* (1972), a report by the Club of Rome, built on Malthus’s ideas. It went beyond just food supply to consider a broader range of factors in calculating a planetary limit. These factors included resource availability, environmental pollution, and industrial output. The report remains relevant from an environmental point of view, as it challenges the assumptions of limitless growth, even though its specific predictions haven’t quite come true.

A significant development in sustainability science is the planetary boundaries concept, introduced in 2009. Unlike earlier theories focused solely on population limits, this framework uses Earth system science parameters. Researchers identified the Holocene epoch as a baseline, as this was a period of remarkable stability for human development. Significant deviations from this ideal state could push humanity towards uncertain “tipping points” – critical thresholds that can either interrupt previous progress, alter its course, or even accelerate it in unintended ways. An example might be the extinction of megafauna at the end of the last ice age, potentially linked to human arrival in the Americas. The planetary boundaries concept promotes the precautionary principle, urging action to minimize potential harm to both humans and the environment.

The concept, which puts forward nine planetary boundaries, was first introduced by Johan Rockström et al. (2009). It was updated by Will Steffen et al. (2015). A recent update by Richardson et al. (2023) shows that six out of nine planetary boundaries have already been transgressed.

The planetary boundaries framework identifies nine critical Earth system processes. These processes regulate the planet’s stability and include, for example, land system change and ocean acidification (see all planetary boundaries here: Figure 2.1). Each boundary has an inner circle, within which it can operate safely (“safe operating space”) and an outer circle, which represents increased uncertainty.

The latest update to the planetary boundaries framework paints a concerning picture. We’re close to overstepping the safe operating space for ocean acidification, and regional atmospheric aerosol loading has already crossed its boundary. In a positive development, stratospheric ozone levels show some signs of recovery. However, the overall situation is alarming. The boundaries previously identified as transgressed (climate change, biosphere integrity (genetic diversity), land system change, and biogeochemical flows [N and P]) have all seen a worsening of their transgression since 2015.

The study added human appropriation of net primary production as a control variable for the functional component of biosphere integrity, arguing that this boundary has also been exceeded. In addition, the significant transgression of the planetary boundaries for phosphorus and nitrogen cycles, along with genetic biodiversity, raise the risk of fatal consequences.

Two of the nine planetary boundaries – biosphere integrity and climate change – are considered “core boundaries”. These core systems encompass processes from many other subsystems and operate at a global scale. Reaching tipping points in these core systems could therefore push the entire Earth system into a new state.

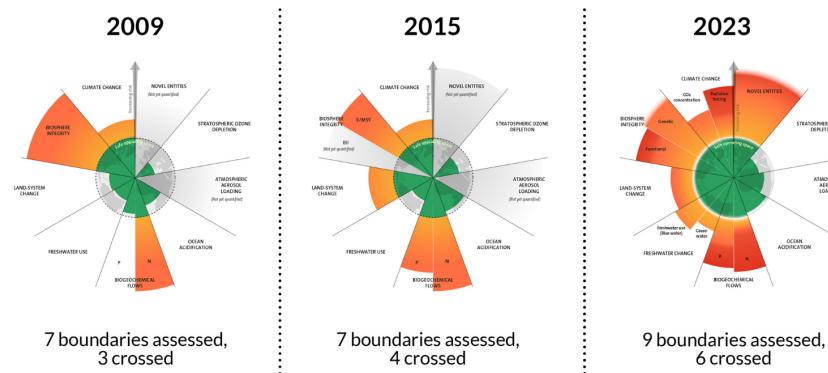


Figure 2.1: Development of control variables for all nine planetary boundaries (Source: UNEP (2021b))

2.2.1 Tipping points of the Earth's climate system

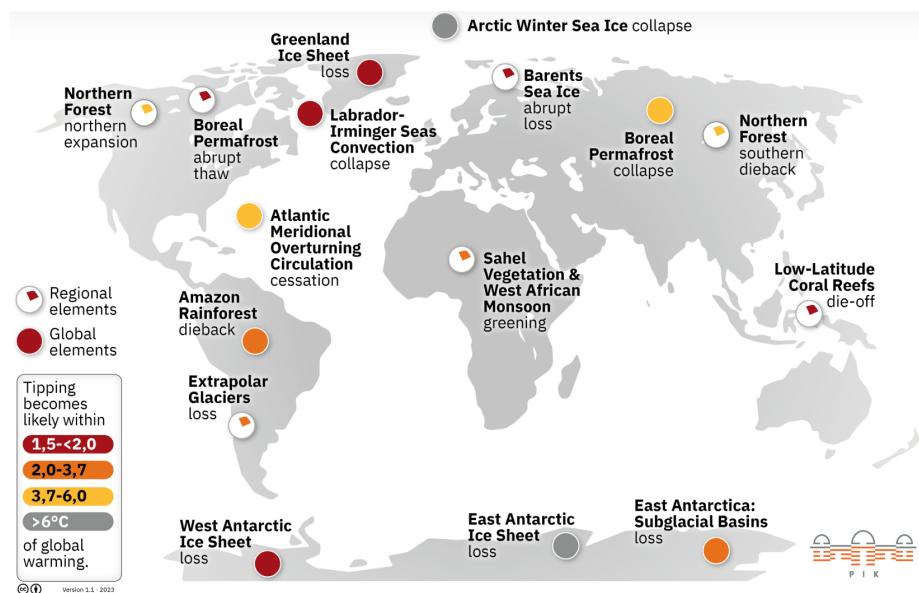


Figure 2.2: Tipping points (Source:)

Tipping points in the Earth's climate system are critical thresholds that, when crossed, can cause abrupt and often irreversible changes in the climate system. These tipping points can destabilize the climate and lead to accelerated climate change. Examples of tipping points include the melting of the Greenland ice sheet, the collapse of the Amazon rainforest, the thawing of permafrost soils, and changes in the Gulf Stream. If these tipping points are reached or exceeded, they can trigger self-reinforcing feedback effects that lead to further warming and an intensification of climate change.

The concept of tipping points emphasizes the urgency of limiting global warming and reducing greenhouse gas emissions. If we exceed the tipping points, it will become increasingly difficult to control climate change and minimize its effects.

2.2.2 Quantifying planetary boundaries

A recent development within the planetary boundaries framework is the concept of “safe and just Earth system boundaries (ESBs)” for the following domains: climate, the biosphere, water and nutrient cycles, and aerosols at global and subglobal scales (Rockström et al., 2023). The ESBs are based on modelling and literature review, and account for uncertainty through different levels of likelihood. Staying within the ESBs protects stability and equity between species and future generations, although current generations, especially vulnerable groups, could still suffer harm. The authors therefore suggest stricter boundaries in some cases, and the addition of local standards to protect current generations and ecosystems. For example, they identify safe ESBs for warming (see Rockström et al. 2023, Fig. 1 and Table 1). These are based on reducing the probability of triggering climate tipping points, maintaining biosphere and cryosphere functions, and considering climate variability of the Holocene (<0.5-1.0°C) and earlier interglacial periods (<1.5-2°C).

The functions of the cryosphere include the preservation of permafrost in the northern high latitudes, the preservation of polar ice sheets and mountain glaciers, and the minimization of sea ice loss. The authors conclude that global warming of more than 1.0°C above pre-industrial levels, which has already been exceeded (IPPC 2021), could trigger tipping effects such as the collapse of the Greenland ice sheet or a localized abrupt thawing of the boreal permafrost with a moderate probability (Armstrong et al. 2022). Global warming of one degree Celsius corresponds to the safe limit proposed in 1990 and the PB of 350 ppm CO₂ (Steffen et al. 2015). With a warming of more than 1.5°C or 2.0°C, the likelihood of triggering tipping points increases to high or very high.

2.2.3 Climate resilience

Resilience describes the ability of a system to withstand disruptions, “bounce back”, or recover from adversity. Originally used in psychology, resilience refers to the psychological robustness that an individual has actively acquired in dealing with challenges or stresses, particularly in childhood. In the context of ecosystems, resilience refers to the ability to absorb disturbances without a permanent systemic collapse, i.e. a collapse that would result in a different system regulated by new processes (Folke et al. 2010). More recently, the concept of resilience has been extended to social systems (see section on doughnut economics). Studies focus on which specific characteristics of a region need to be strengthened, to better prepare it for future crises and disasters related to climate change, terrorism, resource scarcity, or financial crises. The climate crisis, for example, requires both adaptation and mitigation measures. Resilience approaches offer a way of combining these two concepts rather than playing them off against each other.

Climate mitigation measures aim to reduce greenhouse gas emissions and curb climate change. Such measures include promoting renewable energies, improving energy efficiency, and expanding public transport. Resilience approaches emphasize the im-

portance of climate mitigation, as limiting the rise in temperature will help to reduce the intensity and frequency of extreme weather events.

Climate adaptation measures aim to make societies and ecosystems more resilient to the current and expected effects of climate change. Adaptation measures include the development of early warning systems for extreme weather events, coastal protection against rising sea levels, the reduction of heat stress (e.g. through more urban green spaces), runoff or infiltration areas to reduce the damaging effects of heavy rainfall events, or the adaptation of agricultural practices to changing climatic conditions. Resilience approaches emphasize the need for climate adaptation to protect communities and ecosystems from the negative effects of climate change.

2.2.4 Conclusion

The concept of planetary boundaries tries to reduce complex ecological relationships to a small number of quantifiable limits. These specific limits and indicators for planetary boundaries are based on scientific findings that are not always clear or consistent. The boundaries are therefore contested by some scholars, who question the accuracy and reliability of the data and models used. Despite this criticism, the planetary boundaries framework makes a valuable contribution to the debate on sustainable development and raises awareness of the limited resources and resilience of our planet. To summarize:

- The planetary boundaries framework focuses on the ecological/biophysical limits of the Earth's resilience, and thus the environmental dimension of sustainable development.
- These limits to resilience – the planetary boundaries – focus on environmental factors that are considered fundamental to human survival.
- In normative terms, the framework aims to maintain the stable Earth system (“state of equilibrium”) of the Holocene, thereby mitigating threats to human survival.
- The planetary boundaries framework can be used to set concrete targets in the environmental dimension (e.g. at the global or national level).

Further readings

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Folke C, Carpenter SR, Walker B, Scheffer M, Chapin T, Rockström J. 2010. Resilience Thinking: Integrating Resilience, Adaptability and Transformability. *Ecology and Society*. 15(4).. <https://www.jstor.org/stable/26268226>.

Part III

Transforming (Un-)sustainable systems: Key areas and strategic approaches

Chapter 3

Environmental Sustainability

The economy is integral not only to society, but also to nature. Humans are living beings and therefore reliant on material resources to fulfill their needs. They also require intact ecosystems and a climate suitable for human habitation. When we speak of “environmental sustainability”, we generally mean the protection of the diversity and functioning of natural ecosystems and the services they provide for future generations. This is an anthropocentric definition, as it focuses on human activities and how these seek to ensure the long-term sustainability of nature for human benefit. This perspective is also reflected in our everyday language and our dualistic separation of “human” and “environment”, a separation that goes back to the 19th century and persists to this day. For example, we separate science into “natural science” and “social science”, and our analyses often conceptualize environmental damage as “externalities”. Another understanding of environmental sustainability emphasizes the importance of maintaining the self-regulation of the Earth’s climate system. This view highlights the interaction and feedback between various components of the Earth’s climate system.

3.1 The normative dimension of environmental sustainability

Although our understanding of how ecosystems work is based on thoroughly researched empirical information (and therefore constitutes “systems knowledge”), environmental sustainability remains a normative concept. This means that it is based not only on scientific findings, but also on an ethical evaluation (Figure 3.1). The various interpretations of environmental sustainability offer different answers to the question of what should be preserved, and why. Each approach to environmental sustainability therefore expresses the desired state of the ecological environment, both now and in the future – what aspects of nature should be preserved or survive from the present to the future. For example, when we talk about ecosystem services, the intention is often to preserve ecosystems in a way that continues to support and maintain our own welfare (in this sense, it is an anthropocentric perspective).

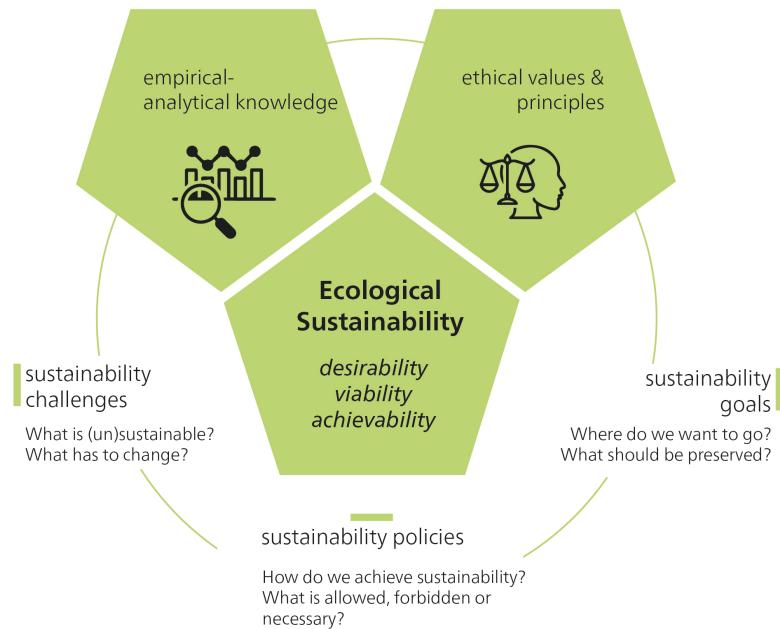


Figure 3.1: The normative dimension of environmental sustainability (Source: Own illustration).

Ethical judgments and justifications shape which ecological properties and functions we preserve for future generations, and which we deem intrinsically valuable in nature. What constitutes a desirable state for ecosystems, and why? What aspects of the ecological environment deserve protection, and what is the aim of this protection? Is it necessary to keep ecosystems as pristine as possible, and how do we define “naturalness”? To what extent should we use ecosystems for human purposes without restriction, and are there areas that we should leave for organisms to use, with minimum human intervention? Interpretations of environmental sustainability depend on the goals being pursued: for whom, why, and how (Figure 3.1).

Tip

Specific examples of ethical assessments in the context of environmental sustainability

Wildlife conservation: Should we intervene in natural wildlife populations to protect endangered species and maintain the balance of ecosystems? Or should we leave nature as untouched as possible, even if this means losing some species? Biotechnological interventions: Is it morally acceptable to use biotechnological methods, such as genetic engineering, to alter the ecological characteristics of organisms and potentially influence ecosystems?

Conservation of endangered species: Should we focus on protecting and preserving endangered species to maintain biodiversity, or should we focus on preserving broadly available species that are more important for the human diet or the economy?

Protecting ecosystems: Should we establish protected areas to preserve threatened ecosystems and species, even if this restricts local communities in their economic activities? How can we strike a balance between conservation and sustainable use?

3.2 Ecosystems, Ecosystem management, and Ecosystem services

An ecosystem is a group of living organisms and their physical surroundings that interact with each other. Ecosystems can range from small, like a flowerpot, to large, like an ocean. When similar ecosystems are found in a larger region with the same climate, they are called biomes. Energy and material flows are important for the functioning of an ecosystem. Some of these flows, such as the carbon cycle, take place at the global level, while others are more localized. Most ecosystems obtain their energy from the sun and can influence the Earth's climate through their interactions (Quelle: Britannica).

Ecosystem services are the benefits that humans derive from ecosystems such as mangrove forests, oceans, or wetlands. The services provided by ecosystems include the provision of clean water, the prevention of flooding, the promotion of crop growth, and the provision of places for leisure activities. The Millennium Ecosystem Assessment, published in 2005, divides ecosystem services into four categories (cf. green Box in Figure 3.2): *provisioning services*, *regulating services*, *cultural services*, and *supporting services* (Quelle: MEA, 2005). Note that the supporting services, which are primarily fundamental biophysical processes, enable and guarantee the other services in the first place.

3.2. ECOSYSTEMS, ECOSYSTEM MANAGEMENT, AND ECOSYSTEM SERVICES 53

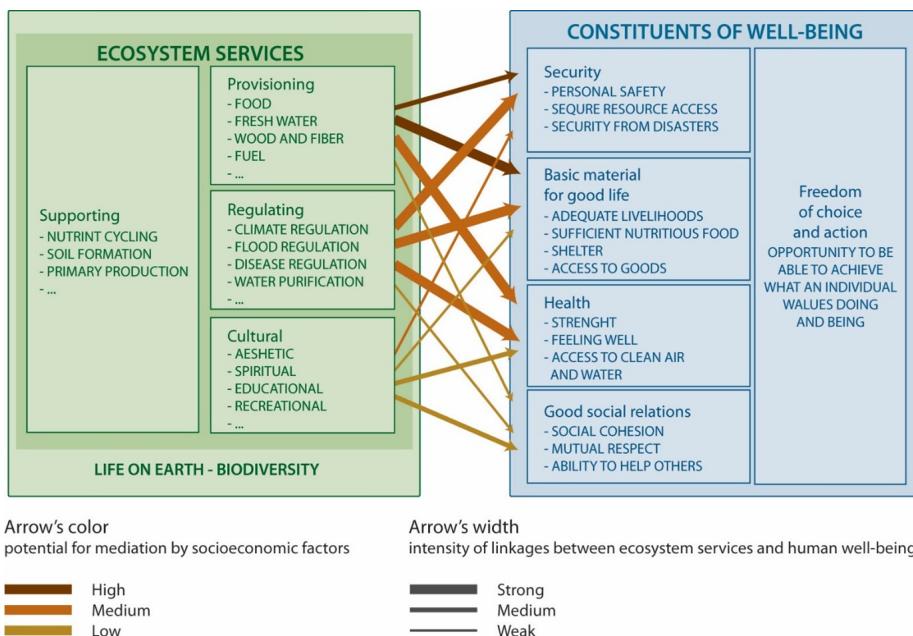


Figure 3.2: Millennium Ecosystem Assessment (Source: The Millennium Ecosystem Assessment)

According to the Millennium Ecosystem Assessment, these ecosystem services can improve our quality of life and our economy (cf. blue Box in Figure 3.2). While this way of looking at ecosystems views humans as separate from the environment, it emphasizes the relevance of ecosystem services for human well-being. Ultimately, the concept of ecosystem services seeks to place greater consideration on the value of nature in policy and economic decisions. However, the ecosystem services concept also plays a role in landscape and spatial planning. For example, it's used to analyse how spatially effective (legal) regulations impact ecosystem services, and consequently, human well-being (Quelle: cf. Albert et al. 2016).

Tip

Case study: Ecosystem services in Madagascar

This landscape on the eastern coast of Madagascar offers a case study for ecosystem services. Ecosystem services in this area include firewood, which is used by local inhabitants for cooking, and rice, which is a staple food. Describing agricultural products such as these as ecosystem services illustrates that they only become "services" through human demand. Ecosystem services are not given in nature per se: instead, they represent a perspective through which humans view and describe the environment. Other ecosystem services in this landscape include the water cycle, which is vital for local inhabitants, as they rely on rivers for drinking water. Water is also used for agricultural irrigation and other purposes. Climate regulation is another significant service, important both locally and globally.

This landscape clearly illustrates that the demand for and importance of ecosys-

tem services vary among individuals or groups. Such diverse claims on ecosystem services from the same land can lead to **conflicts of interest**. Demand for agricultural products or firewood, for example, can conflict with climate-regulating and biodiversity-promoting (international) demands on the rainforest.

Humans have had an influence on many ecosystem services, both directly and indirectly. While these impacts have often been negative, some have been positive. For example, replacing natural ecosystems with cultivated agroecosystems has increased the value of ecosystem services for humans. Take, for example, dry meadows and pastures in Switzerland. Only through centuries of forest clearing and extensive agricultural use in alpine locations could the ecosystem services these areas provided (in this case, fodder production) be used and increased. At the same time, these anthropogenically influenced sites harboured rare meadow plants and pollinators, thus fostering a high level of biodiversity. These areas are also vital for tourism, as they significantly shape the alpine landscape. Consequently, these extensively used areas generally offer greater overall ecosystem service multifunctionality than intensively farmed grasslands (Quelle: Richter et al. 2024).

Many of the negative effects on ecosystems and their services result directly from human land use and overfishing. In addition, indirect factors such as climate change and invasive non-native species significantly impair the stability and functionality of ecosystems. Two research projects with significant CDE involvement – Woody Weeds and Woody Weeds+ – have demonstrated that invasive woody plants such as *Prosopis juliflora* have a major impact on biodiversity and local livelihoods in East Africa. Originally introduced to combat desertification and timber extraction, this species displaces native vegetation and is not suitable as animal feed without processing (CDE).

3.2.1 The monetary valuation of ecosystem management

The term *nature's services* first appeared in the publication “How much are Nature's Services Worth?” (Quelle: Westman, 1977). The synonymous term “*ecosystem services*” was coined a few years later (Quelle: Ehrlich and Ehrlich, 1981). The concept of ecosystem services and the thinking behind it are closely linked to economic philosophy and practice (Quelle: Gómez-Baggethun et al. 2010). Around 20 years after the introduction of “nature's services”, Robert Costanza and colleagues estimated that the **global value of 17 ecosystem services was worth 33 trillion US dollars per year** (Quelle: Costanza et al. 1997). A recalculation in 2011 showed that this value had already fallen by between 4.3 trillion and 20.2 trillion US dollars per year (Quelle: Costanza et al. 2014). It is predicted that by 2050, the value of ecosystem services will either drop by up to USD 51 trillion per year, or rise by up to USD 30 trillion per year, depending on land use scenario (Quelle: Kubiszewski et al. 2017).

Calculating the **monetary value of ecosystem services** typically involves three steps and requires high-quality and differentiated data. 1) The first step is to measure the change in ecosystem services after an intervention, thus placing the focus not on the status quo, but on the difference. 2) The second step is to evaluate the impact of this change on people's socio-economic well-being. 3) The third and final step is to place a monetary value on the resulting change in productivity or prosperity (Quelle: *M1 Lecture by Astrid Zabel*). There are **many different methods for calculating the mone-**

tary value of ecosystem services (Figure 3.3). One such method is “green accounting”, which uses existing market values, if available, or exchange values as an approximation (e.g. comparing avalanche barriers and protection forests). Another method is cost–benefit analysis, which can be divided into two types: stated preferences and revealed preferences.

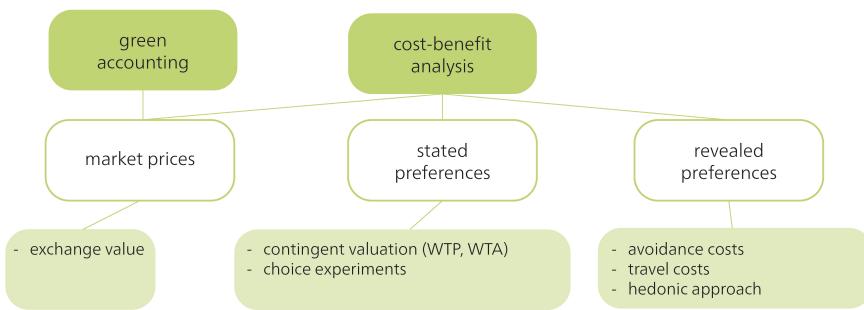


Figure 3.3: the monetary value of ecosystem services (Quelle?)

Stated preferences involves people stating (e.g. in a survey) the extent to which they would be willing to pay for certain ecosystem services, or which changes they would be willing to accept (contingent valuation). Another variation of this method involves choosing between different (usually sub-optimal) options, each representing a trade-off based on changes in ecosystem services (which are then analysed econometrically). In contrast, **revealed preferences** are based on actual behaviour. For example, it involves analysing avoidance costs (e.g. how much people pay for noise barriers) or calculating travel costs (which assumes that the time and travel costs incurred for visiting a destination reflect the value of the place, and thus, in a broader sense, an ecosystem service). Other methods include using hedonic approaches to determine the extent to which favourable or unfavourable environmental influences, and thus their quality, can affect the value of a property.

Each of these methods has its advantages and disadvantages. They are criticized mainly for their one-sided assessments and failure to account for social inequalities, power relations, and cultural differences. Consequently, these methods are limited in their ability to promote fair and environmentally sustainable decisions (see next chapter).

The principle behind **Payments for Ecosystem Services (PES)** involves compensating land users for maintaining a component of a specific ecosystem service. Such compensation may, for example, be paid by organizations or companies for which these specific ecosystem services are important. A well-known example of PES is the “Pagos por Servicios Ambientales” (PSA) programme in Costa Rica. This national programme, which has been operational since 1997, was set up to reduce deforestation and promote reforestation by paying landowners to maintain, reforest, or sustainably manage forest areas. The payments aim to promote the provision of ecosystem services such as carbon sequestration, water conservation, biodiversity conservation, and scenic beauty. The payments in this project come from various sources, including a tax on fuels and international funding from organizations interested in carbon offsetting. Studies show that the programme has significantly reduced the rate of deforestation in the country

and promoted the conservation of biodiversity, while at the same time increasing the income of landowners (Quelle: Porras et al. 2013).

3.3 Criticism of ecosystem services, and further and alternative concepts

While the concept of ecosystem services has been recognized and applied in the scientific and policy debate, it has also been widely criticized (Quellen: see e.g. Norgaard, 2010; Kosoy & Corbera, 2010). One argument is that by focusing on ecosystem services, we reduce the complex and diverse values of ecosystems to their monetary benefits for humans (Quelle: cf. Schröter et al. 2014). This **economic reduction of nature** neglects the non-quantifiable but nevertheless important aspects of nature, such as spiritual or intrinsic values (Quelle: Fairhead et al. 2012). The commodification of nature through ecosystem services could ultimately also lead to an exploitative relationship between humans and nature (cf. Schröter et al. 2014) or an **exacerbation of social inequalities between powerful actors and marginalized groups** (Quelle: Dawson et al. 2021), as the concept does not explicitly consider justice (Quelle: Loos et al. 2023: 478). In some cases, it is even assumed that the concept of ecosystem services could conflict with – and undermine – biodiversity conservation (cf. Schröter et al. 2014).

“The flurry of enthusiasm for optimizing the economy by including ecosystem services has blinded us to the more important question of how we are going to make the substantial institutional changes to significantly reduce human pressure on ecosystems, especially by the rich, and to adapt to and work effectively with the rapid ecosystem changes being driven by existing and foreseeable climate dynamics.”

— Norgaard 2010: 1220

In response to this criticism, the IPBES (Intergovernmental Platform on Biodiversity and Ecosystem Services), (see Biodiversity chapter) has further developed the concept of ecosystem services and developed another concept, that of *Nature's Contribution to People* (NCP). NCPs are defined as “all the positive contributions, or benefits, and occasionally negative contributions, losses or detriments, that people obtain from nature.” (Quelle: Pascual et al. 2017: 9). The concept may resemble ecosystem services, but it goes further and recognizes that nature and its contributions to a good life can be perceived and viewed in different ways, depending on the cultural and institutional context. The concept seeks to include different world views, such as Indigenous knowledge systems, thus taking into account both intrinsic (i.e. non-anthropocentric) and relational values of nature (Quelle: Díaz et al. 2018). Overall, this approach also includes context-specific perspectives, and it gives greater consideration to the justice dimensions than the concept of ecosystem services does (Quelle: Loos et al. 2023).

However, such **plural valuations** are also subject to criticism and pose various challenges. For example, Jacobs et al. (2023) point out that current approaches to integrating multiple values and perspectives into ecosystem assessments risk merely promoting pseudo-participation, while existing **structures of power and discrimination** remain unchanged. Plural valuations aim for inclusivity and democracy, but they can

*3.3. CRITICISM OF ECOSYSTEM SERVICES, AND FURTHER AND ALTERNATIVE CONCEPTS*⁵⁷

inadvertently lead to conflict, power imbalances, and unclear outcomes if not carefully designed. Scientists have also criticized the above-mentioned NCP concept, which is often seen as an inadequate development of **utilitarian environmentalism**. This is a strongly Western and anthropocentric perspective that maintains a dualistic separation of humans and nature (Quelle: cf. Muradian & Gomez-Baggethun, 2021). Muradian & Gomez-Baggethun (2021: 7), propose that “in order to induce transformative change in human-nature relations we need a shift from a morality of utility to a morality of care, a reallocation of property rights, and the extension of the community of justice to non-human entities.” A notable example of this transformation is the 2017 recognition of New Zealand’s Whanganui River as a legal person (Quelle: see Charpleix, 2018).

Chapter 4

Social Sustainability

Social sustainability is about a community's well-being, encompassing elements like inclusion, equity, and social cohesion. It's often argued that this dimension of sustainable development is harder to grasp than environmental or economic sustainability (Foladori, 2005). That's because social issues may not be as immediately visible as, say, rainforest destruction or hyperinflation. What does sustainability mean when communities are unequally affected through events such as flooding, or when Indigenous peoples are displaced by infrastructure projects? These impacts reveal deep-rooted inequalities that are largely based on societies' social structures.

This is why the social dimension is so important. A society that is socially sustainable is better prepared to tackle challenges fairly and equitably (Ballet et al. 2020). Furthermore, having social acceptance is crucial for successfully implementing sustainability measures and initiatives (Assefa & Frostell, 2007; Wüstenhagen et al. 2007).

In short, social sustainability addresses the following challenge: How can we create a resource-conserving society without increasing poverty and inequality? Achieving this requires balancing fundamental questions of distributive justice with the tension between human needs and wants.

This chapter begins by introducing social sustainability as a normative dimension of sustainable development. We define the concept by focusing on the following key elements: inclusion, social cohesion, resilience, and justice. Finally, we address the cultural aspect. While some scholars see culture as a component of social sustainability, others argue that it should be considered a fourth dimension in its own right – alongside the environmental, social, and economic dimensions (Sabatini, 2019).

4.1 Social sustainability, a normative concept

Interpretations of social sustainability are based, on the one hand, on empirical knowledge about how societies function and, on the other, on ethical judgements about what is valuable and should be pursued. In order to define appropriate sustainability goals, we need to know what ethical principles and values a particular social system is based on. In other words, what does a society or community perceive as "good", desirable, and just?

As a normative concept, social sustainability aims for a fair distribution of benefits and costs within society. It encompasses various dimensions of equality (see Section X) and justice (see Section X), and it examines how the decisions made within a particular society influence the distribution of resources.



Figure 4.1: Social Sustainability. Source: Own illustration

These are aspects exemplified by Kate Raworth's doughnut economics (2017; see Section 3.2), a framework which views the SDGs and human rights as the basis for socially sustainable and equitable human activities. In doughnut economics, meeting the basic needs of all people is key. These basic needs, which form the framework's social foundation, include access to clean water, sanitation, healthcare, education, food, clean cooking facilities, electricity, housing, and information and support networks, as well as the opportunity to work and earn an income. Additional factors which form the social foundation are gender equality, social equality, peace, and justice, as well as political participation – i.e. the ability to exert social influence.

In doughnut economics, economic policies could contribute to achieving social justice by distributing benefits and costs without exceeding planetary boundaries. And therein lies the challenge: Countries that perform well in terms of social sustainability indicators – e.g. access to food, education, or housing – often exceed ecological boundaries. Conversely, countries that stay within these ecological limits often score poorly in social areas (see Figure X; O'Neill et al. 2018). Striking a balance between social and environmental requirements is therefore key.

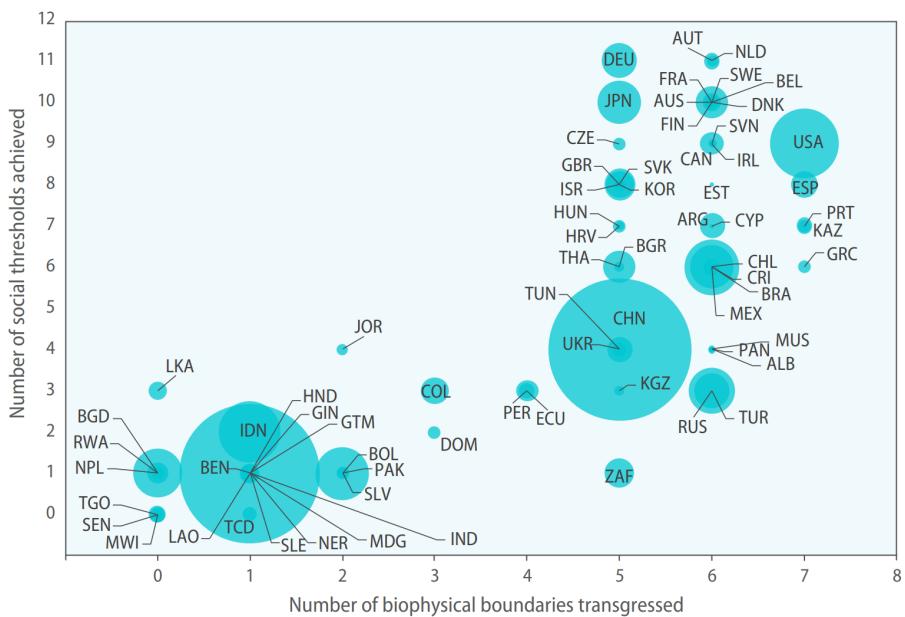


Figure 4.2: Social thresholds achieved versus biophysical boundaries transgressed for different countries, results weighted by each country's population. Source: UN/DESA, based on O'Neill and others (2018), figure 2.

To achieve a sustainable future, Raworth (2017) argues that we must distribute the Earth's resources more fairly. This would allow everyone to meet their basic needs while respecting the planet's limits. It would require changes in lifestyle – especially by the wealthy, who are responsible for the majority of emissions. At present, those who generate more emissions tend to have better access to essential goods such as food, water, energy, and education – the very things that people in lower-income countries often lack. In wealthier countries, people's basic needs are generally met more comprehensively, leading to more prosperity, equality, and justice. At the same time, higher living standards are often linked to increased greenhouse gas emissions and consumption – as seen in Western industrialized countries (e.g. the US, Europe) and China.

Another approach to social sustainability is found in the United Nations Human Development Reports, which use a model of human development rooted in the capability approach (see Section XY). The capability approach asks what a person needs to lead a good and fulfilling life. Because different people need different resources to achieve this, giving everyone the same thing does not foster true equality. Instead, we should provide each person with what they need to live a life they can value. This model of human development promotes respect for human dignity as an inalienable right and advocates providing realistic opportunities for everyone to flourish.

4.1.1 Dimensions of justice

Doughnut economics and the capability approach are two examples of pithy and influential normative frameworks. In this chapter, we cover a range of concepts and

approaches that – through their social dimensions - inherently involve normative and ethical considerations (see Section XYin particular).

The many theories and concepts of social sustainability are also linked to different ideas of “justice”. Some of these are described in more detail in Section X. Three frequently mentioned dimensions are: distributive justice, procedural justice, and recognition justice (de Bruin et al., 2024; Tribaldos & Kortetmäki, 2022; Wijsman & Berbés-Blázquez, 2022).

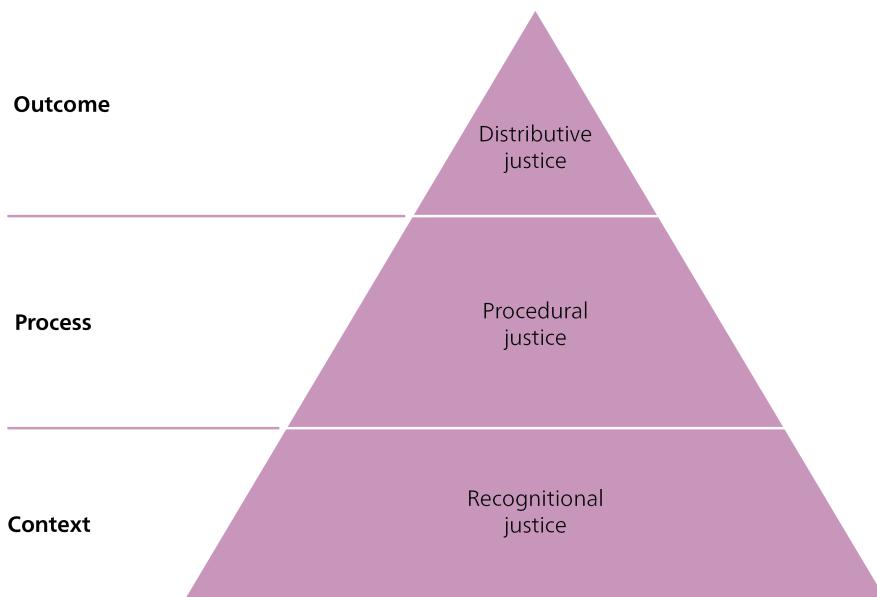


Figure 4.3: The respective focus areas of distributive justice, procedural justice, and recognition justice. Source: Own illustration adapted from See & Wilmsen (2022).

Distributive justice is a results-oriented concept that aims at a fair distribution of goods and burdens, regardless of social differences. This principle applies to issues such as access to clean water, the unequal burden of environmental pollution, or equal pay.

Procedural justice focuses on the inclusivity of decision-making processes. It calls for underrepresented groups to be fairly represented in institutions so that their perspectives can be heard and incorporated into decision-making processes.

Recognition justice emphasizes the importance of the context, and of respect for social and cultural differences. It involves recognizing structural injustices, respecting the dignities and values of different people and social groups, and understanding that diverse needs and preferences are rooted in different historical experiences, identities, and cultural backgrounds.

Table X shows how these three dimensions influence each other (Wijsman & Berbés-Blázquez, 2022). A more detailed discussion of distributive and procedural justice follows in Section 3.2.6, as these are the dimensions that most affect social sustainability debates.

	Distributive justice	Procedural justice	Recognition justice
Distributive justice	The distribution of resources can influence how easy or difficult it is for individuals or communities to participate in decision-making processes. This is because participation requires time, energy, and financial resources.	The distribution of resources can influence whose interests are taken into account	

in decision-making processes – and whose identity is recognized and considered important. || **Procedural justice** | Participation in decision-making processes can have an impact on their outcomes – and therefore on how advantages and disadvantages are distributed between individuals and groups. || Participation in decision-making processes can influence whose interests are heard and which individuals or communities are recognized as important. || **Recognition justice** | Recognizing individuals or groups as valuable can influence how resources are distributed. | Recognizing individuals or groups as valuable can also determine who is invited to participate in decision-making processes. ||

4.2 Defining social sustainability

Over time, discussions on social sustainability have focused on different issues. These include poverty reduction, development, basic needs, livelihoods, and equity – as well as identity, belonging, and community stability and security (Glasson & Wood, 2009). This thematic diversity is reflected in the numerous available definitions of social sustainability. Indeed, the literature is often described as fragmented, vague, or at times chaotic (Mehan & Soflaei, 2017). Some researchers have even argued that the concept of social sustainability has changed more than the environmental and economic dimensions over the past 30 years (Foladori, 2005).

Social sustainability can therefore best be understood as a dynamic concept that takes different forms, depending on the time and place (Boyer et al. 2016; Dempsey et al. 2011). Social priorities are diverse and context-specific, and they change over time. In addition, there are major cultural and local differences with regard to what is considered socially justifiable and desirable.

Despite this diversity, definitions of social sustainability generally describe a positive state that already exists or is considered achievable. It is often associated with the goal of strengthening social cohesion and providing basic services that contribute to well-being, such as healthcare, education, mobility, housing, or leisure facilities. Social

sustainability is achieved when social processes, systems, structures, and relationships actively support current and future generations in creating healthy and viable communities.

For the Brundtland Commission (Our Common Future, 1987), the main goal of the social dimension of sustainable development is to fulfil basic human needs. These include not only clean water, food, and security – they also extend to aspects such as well-being, justice, a democratic system of government, and a vibrant civil society. This comprehensive definition can be applied flexibly in different contexts.

In a bid to provide a more concrete framework, Barron et al. (2023) and Cuesta et al. (2024) propose the following structured approach (see Figure X).

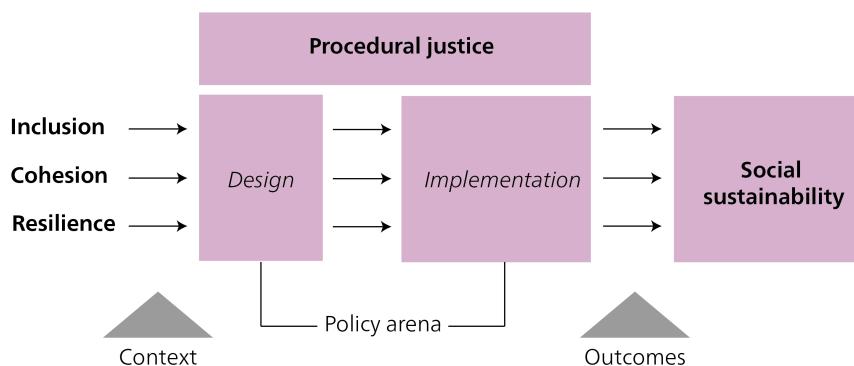


Figure 4.4: A structured approach to social sustainability. Adapted from Barron et al. (2023, p. 31) & Cuesta et al. (2024).

The left-hand side of Figure X depicts three dimensions of a particular context, namely: inclusion, social cohesion, and resilience. Each of these dimensions – defined below – may be found in a community or society to a greater or lesser extent:

1. **Inclusion** refers to the access of all individuals and groups to the economic, political, social, and cultural spheres.
2. **Social cohesion** is a shared sense of belonging and trust that enables communities and groups to work together without conflict.
3. **Resilience** refers to the ability to avoid internal or external shocks – such as environmental changes or political crises – or to cushion their effects.

The middle part emphasizes the importance of **procedural justice**—the fairness of decision-making processes in the **design** and **implementation** of policies and programs. When these processes are perceived as fair, transparent, and trustworthy, they generate **process legitimacy**, meaning that people accept the authority of decisions and are more likely to support and comply with them. The process of designing and implementing policies and programs takes place within a so-called “policy arena”. The term “policy arena” is broadly defined and encompasses political forums at the local, national, regional, or global level, where resources are allocated, goals are set, and decisions are made.

Finally, the right-hand side of the figure depicts the outcomes of the design and implementation process. This process can foster – but also inhibit – inclusion, social cohesion, and resilience. These outcomes, in turn, influence the future level of social sustainability. In other words, social sustainability exists when inclusion, social cohesion, and resilience are gradually strengthened over time – ideally in a legitimate and transparent process.

The following sections explain the core elements of inclusion, social cohesion, resilience, and justice (both procedural and distributive) in more detail.

4.3 Inclusion

Inclusion addresses issues of social inequality. Social inclusion aims at enabling all people to participate in society – specifically, by reducing deep-rooted systemic disadvantages. Many individuals and groups face barriers that limit their socio-economic participation. While such barriers may include poverty or having a low income, other forms of discrimination and exclusion may be based on gender, age, origin, occupation, ethnicity, religion, nationality, disability, sexual orientation, or gender identity. Such inequalities are reinforced by formal and informal norms, behaviour, laws, and institutions.

This raises normative questions: At what point is inequality considered problematic? And what level of inequality is socially unacceptable? Inclusion should not be understood as a form of charity, i.e. as something that is only “right” for ethical reasons. Reducing inequalities has considerable benefits for all of society. Greater inclusion and equal opportunities lead to better results in income, poverty reduction, and human capital (OECD, 2015).

For example, a US study by Hsieh et al. (2013) found that a reduction in discrimination against female and Black workers accounted for 15 to 20% of economic growth per worker between 1960 and 2010. This growth was attributed to an increase in talented people gaining access to better opportunities. Other studies show that gender inequality can have a negative impact on economic growth (Fabrizio et al. 2018; Klasen & Lamanna, 2009). There is also a link between inclusion and social stability: countries that actively promote the political participation and inclusion of disadvantaged groups tend to experience fewer social conflicts (United Nations & World Bank, 2018).

In short, the costs of social inequality – such as fewer educational opportunities, lower lifetime incomes, or poorer health (Buehren et al. 2019; Wodon & de la Briere, 2018) – are not only ethical issues. They also affect the overall economy, as they reduce potential, weaken productivity, and increase the risk of conflict. By contrast, more inclusive societies are more just, more stable, and more economically efficient.

4.3.1 (In)equality

As inequality is complex and diverse, there are different ways of analysing, measuring, and evaluating it. This involves asking questions about *who* is affected and *where* – and in *what* fields inequalities occur (see Figure X; Sen, 1979).

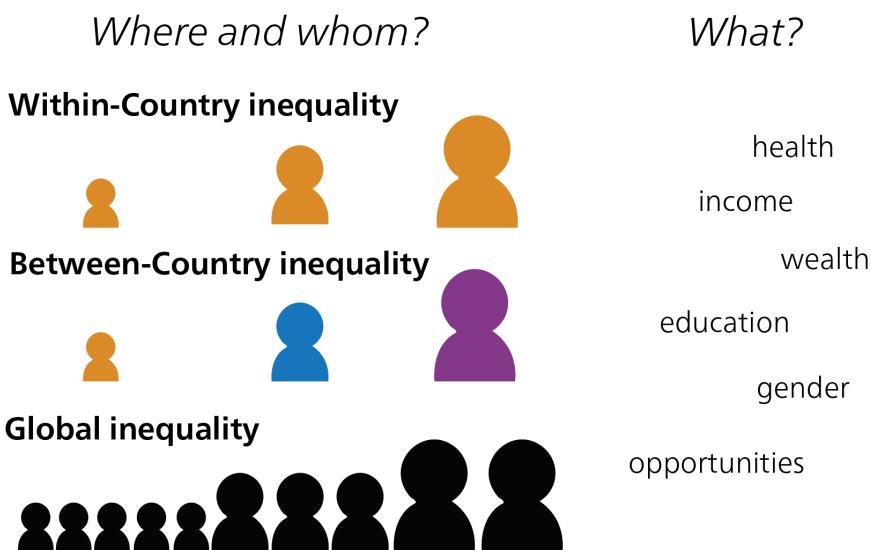


Figure 4.5: Equality of what? Source: Own illustration based from Sen (1979)

Inequality can be approached from various perspectives. Below, we provide more detail on the aforementioned capability approach.

Approaching inequality: Guided by Sen's question “Equality of what?” - the capability approach

The **capability approach** provides a normative framework for assessing inequality and human well-being that goes beyond conventional distribution principles. Traditional approaches to distributive justice often aim either at ensuring equal distribution based on performance or at guaranteeing a minimum level of resources for all. However, achieving complete equality between individuals – i.e. *equality of outcome* – is nearly impossible, as many influencing factors are distributed randomly or unfairly. It is therefore considered fairer to focus on *equality of opportunity*. This principle aims to ensure that every person has the chance to lead a meaningful and dignified life with access to at least a minimum level of prosperity. This minimum level should suffice to cover basic needs and guarantee equal civil rights, ensuring that everyone has what they need to meet their needs and participate equally in society.

Developed in the 1980s by the Indian economist, philosopher, and Nobel Prize winner **Amartya Sen** and later expanded by the philosopher **Martha Nussbaum**, the capability approach serves as an alternative to traditional welfare economics, which measures prosperity primarily through economic indicators (Roder, 2020). The capability approach shifts attention away from formal entitlements or economic aggregates toward people's **real freedoms to live the life they value**. It emphasizes that genuine development depends not only on the existence of opportunities and resources but also on whether individuals can actually make use of them in practice. This, in turn, is shaped by personal factors such as health or disability as well as by social, political, and environmental conditions. For instance, for people with disabilities, well-being requires more than the formal recognition of rights; it depends on an inclusive society

that removes barriers, combats discrimination, ensures access to education, and enables participation in political and social decision-making.

The capability approach defines well-being in terms of **capabilities** and **functionings**. Capabilities are real opportunities for action – i.e. what people could do or be if they were free to choose. For example, being well-nourished, getting married, being educated, or travelling without restrictions. Functionings are the capabilities that are actually converted. Whether people can convert available resources such as income, education, or public services into functionings depends on **conversion factors**. These include personal characteristics, social structures, and environmental conditions. They ultimately determine whether capabilities and functionings can actually be used.

The capability approach, therefore, shifts the focus from **equality** to **equity**. While *equality* aims to ensure that everyone receives the same resources (i.e. input), *equity* focuses on the result: what does a person need, to achieve a comparable level of well-being (i.e. output)? (see Figure X).

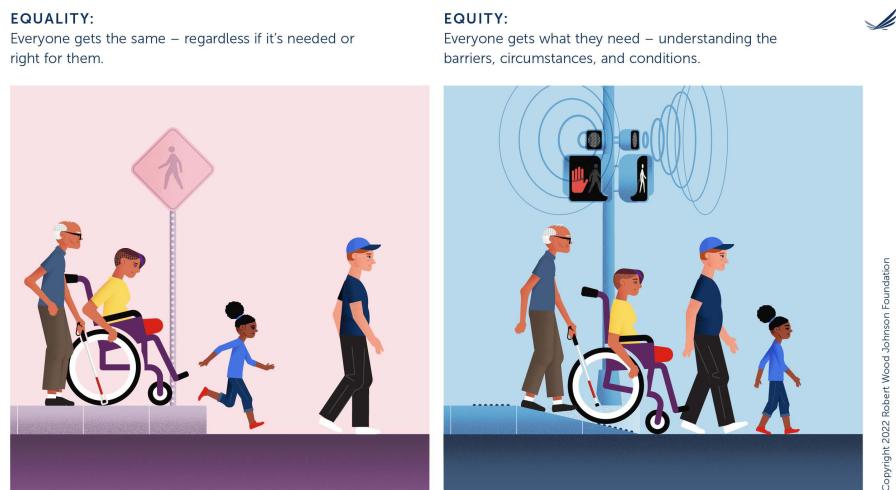


Figure 4.6: Equality vs. equity. Source: Reproduced with permission of the Robert Wood Johnson Foundation, Princeton, N.J.

Approaching inequality: Where and whom?

Building on the capability approach, which emphasizes people's real opportunities to lead the lives they value, it is crucial to recognize that inequality can manifest in different ways and be assessed across various dimensions. Inequality can be analyzed in different spaces, for example by distinguishing between **absolute** and **relative inequality** (Niño-Zarazúa et al. 2017) or between **vertical** and **horizontal** inequality (Stewart, 2005).

Absolute inequality describes a situation in which people are unable to meet their most basic survival needs. This is the case, for example, when a person does not have access to clean drinking water, enough food, or safe housing, and lives below the poverty line. This form of inequality is often defined by fixed income thresholds, such as the World Bank's international poverty line.

Relative inequality measures a person's disadvantage in relation to the average standard of living within a particular society or community. For example, while a family in a rich country may have enough income to cover food and housing, they may lack the resources to participate fully in society – if, say, they can't afford internet access or their children's school trips. Relative inequality becomes evident when living conditions fall significantly below the social average. It often leads to social exclusion and limits access to resources and the opportunities necessary to lead a dignified and self-determined life in a particular social context. The key difference between the two concepts is that **absolute poverty** refers to an objective lack of essential goods, while **relative poverty** describes a person's social and economic status in relation to others in a society (Niño-Zarazúa et al. 2017).

Another concept distinguishes between **vertical** and **horizontal inequality**. Vertical inequality focuses on socio-economic differences between individuals – such as in income, occupational status, or education. By contrast, horizontal inequality refers to differences between culturally defined groups, based for example on gender, age, marital status, nationality, region, or place of residence (Stewart, 2005).

How to analyze inequality? Individual vs. structural approaches

Analyses of inequality often distinguish between **individual inequality** and **structural inequality**. An analysis of individual inequality draws on the principles of welfare economics and the concept of absolute inequality. It focuses on socio-economic characteristics such as differences in income, educational level, and occupational status. This approach assumes that economic inequalities are primarily the result of personal attributes and individual effort.

By contrast, analyses of structural inequality are more closely aligned with the concepts of equity, the capability approach, and relative inequality. Structural inequality is considered not as a product of an individual's characteristics, but as a result of the social framework – such as a person's position within the mode of production or the social hierarchy; their access to wages, profits, or a pension; or their nationality, all of which are key factors of global inequality (see Milanovic, 2019).

This chapter has introduced various perspectives on inequality, including the widely used capability approach, which offers an overarching and normative perspective. The other perspectives may sound similar, but in fact differ in their focus (see Table X).

	relative vs. absolute	vertical vs. horizontal	individual vs. structural
What is being compared?	Inequality measured in relation to differences vs. absolute differences	Differences between income levels vs. differences between social groups	Differences due to personal characteristics vs. differences due to social structures
Focus	Categorization of inequality: Who has more/less?	Categorization of inequality: How is inequality quantified and represented?	Analysis dimension of inequality: What are the causes of inequality?

	relative vs. absolute	vertical vs. horizontal	individual vs. structural
Typical example	The wealthy receive 40% of the income, while the poor receive 10% (relative) vs. the income gap required to meet basic needs (absolute)	A CEO earns 100x more than a cleaner (vertical) vs. women earn less than men for the same work (horizontal)	Individual: someone becomes successful through talent and effort vs. structural: someone is disadvantaged because of where they come from
Policy relevance	Distributive justice vs. combating poverty	Redistribution vs. anti-discrimination	Promotion of equal opportunities vs. reform of social structures

4.4 Social cohesion

Social cohesion describes the feeling of togetherness, trust, and willingness to cooperate – within groups, between different groups, and towards state institutions. The concept describes the extent to which people and communities act based on interpersonal and institutional trust, what attitudes they have towards minorities, and how secure they feel. Societies with strong social cohesion can be found in wealthy countries and in countries affected by conflict alike (Cuesta et al. 2024).

Functioning social cohesion and the well-being of a population require that all social groups can participate economically, politically, socially, and culturally. This is closely linked to inclusion and inequality. However, rather than focusing on differences between individuals or specific groups, the concept of social cohesion asks how strongly the whole of society is connected.

Social cohesion is the foundation for mutual trust and collective action. It is considered a core prerequisite for peace and prosperity (Chatterjee et al. 2023). Studies show, for example, that societies with a high level of trust experience less conflict (Putnam, 2000; Rothstein & Uslaner, 2005). By contrast, lower social trust is often associated with greater economic inequality (Jordahl, 2007) (see Figure X).

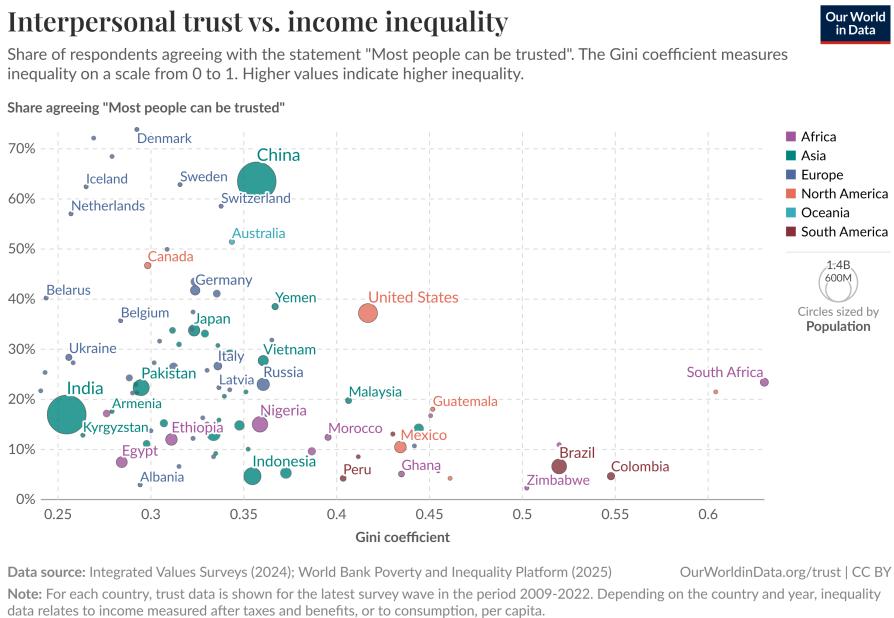


Figure 4.7: Interpersonal trust vs. income inequality. Source: Our World in Data (2024).

The above scatter diagram illustrates the relationship between interpersonal trust and income inequality. Each dot represents a country. Dot colour categorizes countries by their respective regions; dot size reflects the country's population size. The Y-axis depicts the percentage of a country's population that agrees with the statement "Most people can be trusted". The X-axis displays the Gini coefficient, which is a widely used measure of income inequality: a value of 0 indicates a state of complete income equality, while a value of 1 (or 100%) represents maximum income inequality – i.e. a single person holding all the income, while everyone else receives none.

The graph shows that the level of social trust tends to be lower in countries with a higher Gini index. One explanation for the negative correlation between inequality and trust is that people tend to place greater trust in those who are similar to them, and that greater inequality leads to tensions and distributional conflicts (Alesina & La Ferrara, 2002). At the same time, some countries display low levels of trust despite having a low Gini score (e.g. Slovakia, Kyrgyzstan, and Albania). This indicates that although a general trend is recognizable, there is no causal relationship, and other factors are at play.

Key elements of social cohesion

Figure X is just one example of social cohesion. The concept is difficult to define precisely, because the scientific literature varies in regard to its exact meaning and how to measure it. Nevertheless, we can identify three key elements (Schiefer & van der Noll, 2017):

1. **Social relationships:** networks, trust, acceptance of diversity, and participation
2. **Identification with society:** emotional attachment to the social community

3. Orientation towards the common good: a sense of responsibility, solidarity, and compliance with social rules.

Social cohesion is reflected in the attitudes and behaviour of all social groups and encompasses both normative and relational dimensions. It should be understood as a continuum along which societies can display varying degrees of cohesion.

To illustrate how these elements are operationalized, it's worth looking at how social cohesion is measured in Switzerland, where it has a special significance: promoting “internal cohesion” is enshrined in the Federal Constitution as an objective of the Swiss Confederation (Art. 2). A crucial role in connecting people in multilingual Switzerland is played by culture, which acts as “societal cement”. While social cohesion isn't an explicit goal in the 2030 Agenda, it's implicitly addressed in several of its targets. In Switzerland, social cohesion is defined and measured by the Federal Statistical Office, using a range of indicators (see Table X; Federal Statistical Office, 2025).

The first element, **social relationships**, is reflected in political participation such as voting. This element also involves cultural participation, which is measured as the proportion of the population that takes part in cultural activities. Social relationships are negatively affected by factors such as discrimination, which undermines the level of trust people place in fellow human beings and institutions, as well as the sense of belonging to a social network.

The second element, **identification with society**, may be reflected in how people perceive regional equality. In Switzerland, for example, the Federal Statistical Office measures financial differences between the cantons. Multilingualism is also relevant: The ability to communicate with different language communities can strengthen one's sense of belonging and promote intercultural understanding.

The third element, **orientation towards the common good**, encompasses aspects of social participation, particularly in the labour market. This includes, for example, the employment rate of people with disabilities or the unemployment rate according to migration status – indicators of structural inclusion and solidarity. Social inequalities are also key here, measured for example by the rate or risk of poverty among the labour force. Another important indicator is civic engagement, particularly through voluntary work, which is a direct measure of social responsibility and public spirit.

Education is a cross-cutting issue, as it affects all three elements: Education fosters social relationships, strengthens identification with society, and supports an orientation towards the common good by teaching about social norms and values. Relevant indicators include the upper secondary completion rate and the proportion of young people who are not in employment or education.

Table 4.3: Measuring social cohesion in Switzerland

Key element (Schiefer & van der Noll, 2017):	Indicators (Federal Statistical Office, 2025):
Social relationships	<ul style="list-style-type: none"> • Political participation (e.g. voting) • Cultural participation • Experience of discrimination

Key element (Schiefer & van der Noll, 2017):	Indicators (Federal Statistical Office, 2025):
Identification with society	<ul style="list-style-type: none"> • Regional differences (e.g. financial capacity of cantons)
Orientation towards the common good	<ul style="list-style-type: none"> • Multilingualism/cultural integration • Participation in the labour market (e.g. employment rate of people with disabilities) • Social inequality (e.g. poverty level)
Cross-cutting issue	<ul style="list-style-type: none"> • Voluntary work • Education

4.5 Resilience

Resilience is the ability of individuals, households, communities, or entire societies to prepare for, cope with, and recover from shocks (Folke, 2016). Shocks can occur at an individual (e.g. job loss, illness) or societal level (e.g. natural disasters, conflicts, food shortages). They can occur suddenly (e.g. natural disasters), intensify gradually (e.g. soil degradation), or be a constant presence (e.g. poverty, child labour, gender-based violence).

Societies with a high level of resilience can regain their quality of life and economic stability more quickly after a shock. Resilience is especially important for poor and marginalized groups, as they face more shocks, suffer greater relative losses, and receive less support (Bangalore et al. 2017). Inequalities also mean that different groups are unevenly or disproportionately affected by shocks (Hallegatte et al. 2020). Depending on social norms, groups such as women, young people, or the elderly are often more vulnerable or less adaptable (Ajibade et al. 2013; Barrett et al. 2021).

We can identify three distinct strategies for addressing risk and building resilience:

1. **Risk reduction and mitigation:** Measures that reduce the likelihood of shocks or their negative consequences (Obrist et al. 2010). Examples include immunization, income diversification, local protection infrastructure, or state social systems.
2. **Coping strategies:** Responses to shock (Imperiale & Vanclay, 2021; Severi et al. 2012). Coping strategies include insurance models, recourse to savings or loans, and support from social networks. Governments can also help, for example through cash transfers or social programmes. However, without sufficient resources, people affected by shocks may resort to harmful, short-term measures, such as restricting essential consumption, overexploiting resources, or using child labour.
3. **Transformative strategies:** Far-reaching reforms or new institutions that increase the long-term resilience of societies (Mozumder et al. 2018; Pfefferbaum et al. 2017), typically combining risk reduction and coping strategies. For example, establishing a government agency for flood preparedness that improves early

warning systems, fosters risk reduction research, and develops flood response plans. Or introducing measures to reduce the risk of gender-based violence by investing in legal, institutional, and awareness-raising programmes that change incentives and social norms regarding violence.

4.5.1 Basic needs as a prerequisite for resilience

In the aforementioned doughnut economics framework, resilience is only possible if all people can meet their basic needs. Meeting these social foundations ensures that individuals and societies are better able to cope with shocks. However, in countries of the Global South, these basic needs are often unmet. Conversely, while wealthier countries are able to meet these needs, they usually exceed planetary boundaries in doing so. See Figure X comparing Switzerland and Laos (see Section 3.2.1).

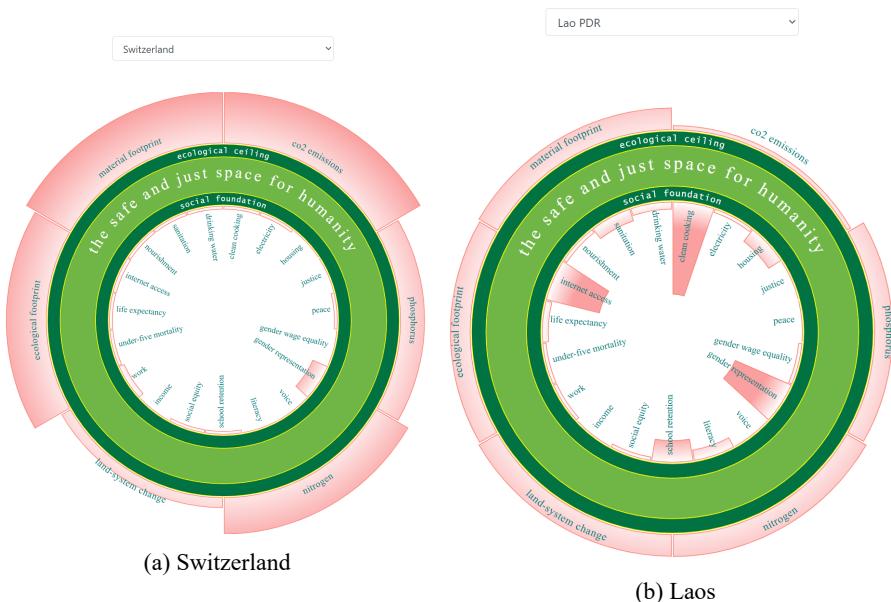


Figure 4.8: Doughnut visualization for Switzerland (left) and Lao PDR (right), comparing each country's performance relative to its social foundation and ecological ceiling. The green doughnut represents the safe and just space where both ecological and social boundaries are respected. Red areas indicate the magnitude of ecological overshoot or shortfalls in meeting social needs, showing where each country exceeds ecological limits or falls below minimum social thresholds. Source: Kate Raworth and Christian Guthier. CC-BY-SA 4.0, <https://doughnut-economy-fxs7576.netlify.app/>

These minimum social standards – the “social floor” – include access to food, health, education, income, and work. They also include peace, justice, political participation, social and gender equality, housing, social networks, energy, and water. In this textbook, we use the example of **food** to show how access to one of these standards affects resilience. Difficulties with a single standard rarely occur in isolation and often affect other areas as well. Ensuring these social foundations is therefore crucial to sustainable development.

Global food security

Food security means having enough food and reliable access to it, especially staple foods. A household is considered food secure when its members are not at risk of hunger or malnutrition. Malnutrition has severe health impacts, such as emaciation and stunted growth. It also increases healthcare costs, reduces productivity, and inhibits economic growth, thereby reinforcing a cycle of poverty and disease.

Food security is closely linked to a food system's resilience – its ability to tolerate and adapt to change. Our global food system is particularly vulnerable due to its complexity and the many interdependencies among its elements. It is exposed to both external threats – such as the consequences of climate change – and internal risks, such as policy failures, unsustainable consumption patterns, or market failures.

Figure X shows that almost 2.4 billion people worldwide were affected by food insecurity in 2022. Just under half of these (1.1 billion) lived in Asia, 37 per cent (868 million) in Africa, 10.5 per cent (248 million) in Latin America and the Caribbean, and around 4 per cent (90 million) in North America and Europe. The figure also shows the proportions of severe and moderate food insecurity: severe food insecurity means that people have difficulty meeting their short-term basic food needs. Moderate food insecurity, on the other hand, refers to an inadequate supply of essential nutrients, which can result in health problems.

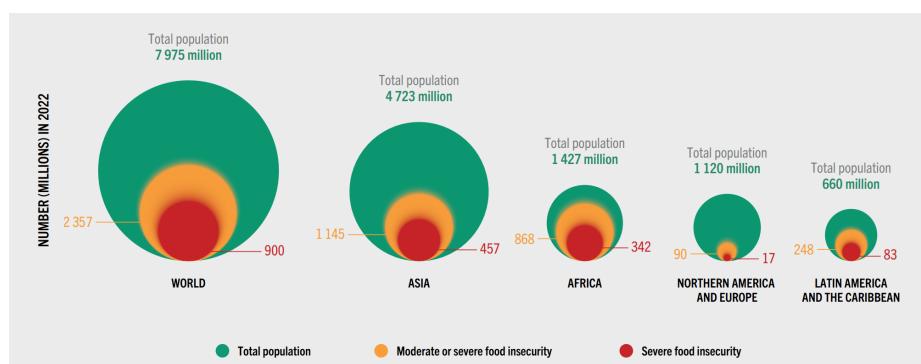


Figure 4.9: The concentration and distribution of food insecurity by severity differ greatly across the regions of the world. Source: FAO et al. (2023). FAOSTAT: Suite of Food Security Indicators, www.fao.org/faostat/en/#data/FS

This demonstrates the need for fair and resilient food systems. As Figure X shows, a food system encompasses all activities, actors, and infrastructures involved in the production, processing, transport, distribution, trade, consumption, and disposal of food. Food systems are deeply embedded in society and the environment. Changes within these systems therefore affect numerous areas: the environment (water, air, soil, biodiversity), social and cultural aspects (e.g. impact on local communities), the economy (value chains, trade, financing), and health (Tribaldos & Kortetmäki, 2022).

Discussions on combating food insecurity often focus on increasing yields and reducing food waste, but these approaches are not proving to be the most effective. Current food production and consumption habits increasingly rely on highly processed

meat and dairy products, as well as intensive production methods. Global consumption leads to outsourced environmental impacts like soil degradation, biodiversity loss, water overuse, and the disappearance of local plant varieties – impacts that primarily affect the producers, not the consumers.

Focusing solely on increasing production also overlooks the fact that the world already produces enough food. What's needed instead is a far-reaching transformation in how these resources are used and distributed. For example, Shepon et al. (2018) found that plant-based substitutes that are nutritionally comparable (e.g. in terms of protein content) are significantly more efficient than animal products: On one hectare of arable land, up to 20 times more food can be produced than with beef and twice as much as with eggs, which represent the most and least resource-intensive animal foods, respectively.

However, the current food system feeds large quantities of edible crops to farm animals. According to Berners-Lee et al. (2018), around 41% of human-edible crops (measured by kilocalories per person per day) are fed to farm animals. This process is highly inefficient: the animals only return around 12% of that energy in the form of meat, fish, and dairy products. In other words, a significant proportion of potential food for human consumption is lost in the process (see Figure X).

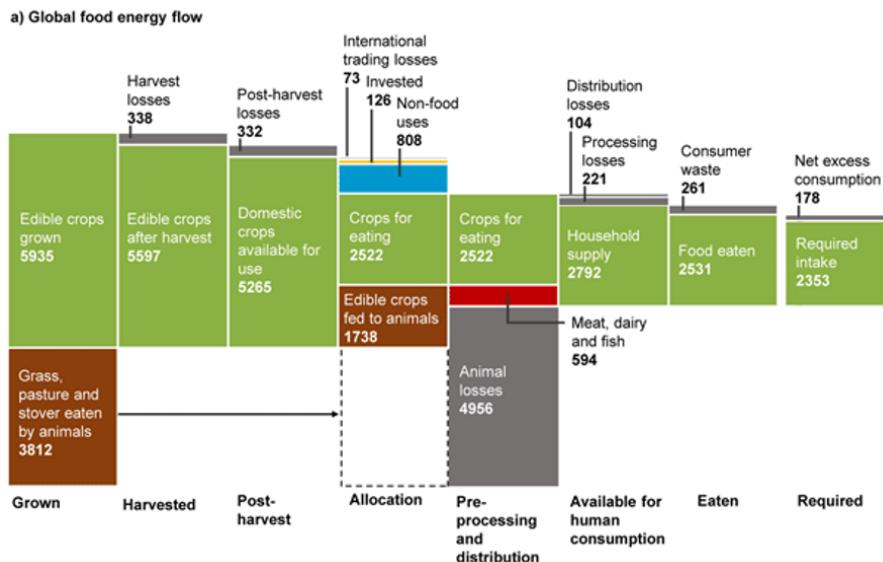


Figure 4.10: The flows of global food energy (kcal/person/day) show the path from the food produced to the food actually consumed in 2013. For crops fed to animals, the units are based on the world population, not the animal population. The left-hand bar distinguishes between crops that are directly edible for humans and fodder crops such as grass, pasture, or crop residues that can only be used by animals. Animal losses (grey bar) include all energy losses that occur in animal husbandry, for example through respiration, growth, movement, and reproduction, as well as through animal components that are not used as food. The outermost right-hand bar divides the nutrients consumed into the proportion required for a healthy human life, i.e. showing a small net increase in food consumption in 2014. Source: (Berners-Lee et al. 2018) licensed under Creative Commons CC BY.

4.6 Justice

4.6.1 Procedural Justice

Inclusion, social cohesion, and resilience are considered the three key dimensions of social sustainability. However, whether these factors actually enable social sustainability depends on a fourth element: **procedural justice**. Procedural justice is decisive in determining whether, and to what extent, social change succeeds across the three dimensions.

Procedural justice focuses on the process. It describes *how* policies are developed, programmes designed, and measures implemented. A high degree of procedural justice is achieved when decision-making processes are perceived as fair, trustworthy, and aligned with social norms (Hinsch, 2016; Wijsman & Berbés-Blázquez, 2022), even when addressing conflicts and tensions. This is not an either/or situation, but rather a continuum: processes can be perceived as more legitimate or less legitimate, and different groups often perceive this differently.

Ensuring legitimacy requires the public perception that decisions are made by trustworthy and recognized actors who act in accordance with shared values and agreed rules. Legitimacy is further strengthened through transparency, participation, and tangible benefits for those affected. This is particularly relevant when decisions entail costs or burdens for certain groups, such as land redistribution, carbon taxes, or changes in working conditions. How procedural justice is achieved largely depends on the respective societal context, culture, and structures. In general, however, we can identify five key drivers:

1. **Ensuring credibility of decision-makers:** Legitimacy increases when authority stems from recognized sources such as elections, expertise, or institutional confirmation.
2. **Adhering to agreed rules:** Processes are considered legitimate if they are based on accepted standards, procedures, or traditions.
3. **Conforming with societal values:** The process takes into account moral, religious, or philosophical beliefs.
4. **Demonstrating perceived benefits:** Legitimacy increases when the affected parties believe they will benefit from the decisions.
5. **Promoting participation and transparency:** Open dialogue and co-creation foster acceptance, especially in the event of conflicts.

These drivers often interact and reinforce each other, with the relative importance of each driver depending on the social context. As shown in Figure X (Section 3.2.2), procedural justice encompasses both the design and the implementation of policies, programmes, and initiatives. These processes take place within a **policy arena**, the term used to describe all constellations in which policies and programmes are formulated and implemented, such as parliaments, ministries, companies, associations, or local initiatives. However, the policy arena is becoming increasingly fragmented and polarized, amid challenges like social media and disinformation. This weakens the credibility of

information and hinders the ability to build broad consensus and legitimacy in decision-making processes.

In Switzerland, this is exemplified by political representation, which fails to adequately reflect the composition of the population: An analysis of the 2023 elections shows that women hold only 37.8% of seats in the National Council. Non-binary people are not yet included in statistics on political representation. In addition, the Swiss parliament is considered a “club of the highly educated”, as the proportion of councillors with a university degree is twice as high as in the general population. Only around one in six (or 16%) of the candidates had a “migration background” – compared to around 40% of the population. A quarter of the adults living in Switzerland do not have the right to vote.

Political scientist Joachim Blatter describes this exclusion from political participation as a “**democratic deficit**”, noting that Switzerland excludes more people from the political system than most other European countries (Blatter et al. 2017). In some municipalities, where only a fraction of the population is entitled to vote, this can mean that ultimately that only 10–20% of residents have a say in political decisions (Debelle, 2020).

4.6.2 Distributive justice

As described in Section 3.2.1.1, the various dimensions of justice influence one another. While **procedural justice** focuses on the process, **distributive justice** concentrates on the outcome of the process. Distributive justice could involve ensuring the fair distribution of environmental resources and environmental impacts. Measures that aim at distributive justice include progressive taxation, social safety nets (e.g. old-age and unemployment insurance), and enforcement of equal pay regardless of gender, ethnicity, or other discriminatory factors.

Historically, discussions about distributive justice were primarily limited to political communities, such as national governments, and focused solely on the current generation. However, sustainability issues require a broader perspective. Distributive justice must be considered globally and intergenerationally, as well as in relation to our responsibility towards the environment and other affected species. Climate targets are a case in point: how should emissions reduction targets be distributed between countries, between generations, or between different social groups? Who should bear the costs of adapting to climate change?

Thus, distributive justice encompasses a wide range of topics. Take the issue of income, for example. In Switzerland, women earn on average CHF 1,364 less per month than men, despite the principle of “equal pay for work of equal value” being enshrined in the Federal Constitution since 1981. Around half of this difference can be explained by objective factors such as education or sector, but the other half – which is as of yet unexplained – could indicate wage discrimination (EBG, 2023). The principle is widely accepted and rarely disputed. Consequently, opponents of measures to implement equal pay tend not to take issue with the principle itself, attempting instead to justify the gap by citing allegedly objective factors.

However, social consensus is far harder to achieve in other questions of distributive justice. Various theories (see Box X) and concepts (see Box X) seek to answer the question of “What is fair?”. They offer different perspectives on what individuals or groups perceive as fair, and provide guidance on how social advantages and disadvantages should

be distributed. A controversial example is that of **unconditional basic income**. From a distributive justice perspective, this concept could be considered fair, as it distributes resources equally and equalizes social opportunities. However, some argue that such a model could weaken incentives to work and thus impair productivity and innovation. Depending on the theory applied (see Box X), very different conclusions can be drawn on such topics – as shown in the reflections after Box x.

Note 1: Theories of justice

Theories of justice describe fundamental, overarching ideas about how social structures and processes should be organized. They are therefore considered one level above concepts of justice (Box X), representing philosophically developed models that define, justify, and explain the essence of justice.

Libertarian theories champion individual freedom and the right to property. Adherents believe the state's role should be minimal, often described as a *night watchman state*.

- In *Anarchy, State, and Utopia* (1974), **Robert Nozick** develops the idea of the minimal state, one that assumes only basic protective functions such as security and contract enforcement. Nozick rejects any further redistribution (e.g. via taxes to fund welfare states) as an *encroachment on individual freedom and property rights*.
- In *The Illusion of Social Justice* (1981), **Friedrich August von Hayek** argues that “social justice” is an empty term, and that no objective distributive justice is possible in complex market societies. Instead, the market should determine the allocation of resources through free pricing, as state intervention would inevitably lead to a loss of freedom.

Liberal theories also analyse societies based on individual rights and property, but they do not recognize a “natural” right to property. Unlike libertarianism, they do not necessarily view the free market as the optimal means of fair distribution and assign an active role to the state in redistribution.

- **Utilitarianism:** What is considered just is that which maximizes happiness (utility) and minimizes suffering, thereby creating the greatest possible long-term benefit for all parties involved.
- **Contractarianism:** In *A Theory of Justice* (1971), John Rawls uses a social contract thought experiment to determine fair principles for society. His two core principles are:
 1. Equal right to basic freedoms: Each person is entitled to the most comprehensive system of equal fundamental freedoms that is compatible with a similar system for everyone else.
 2. Just social and economic inequalities: Inequalities are only considered just if they meet two conditions: they benefit the least advantaged in society (“the difference principle”), and offices and positions are open to all under conditions of fair equality of opportunity.

- **Egalitarianism:** The aim is equal treatment for all, as everyone is equal in terms of dignity and moral status. One prominent approach is the capability approach (see Sections 3.2.1 and 3.2.3). **Ronald Dworkin** offered another key approach, formulating the theory of resource equality in *What is Equality?* (1981). Dworkin posited that a society is just if resources are distributed in such a way that no redistribution would allow for a more equal distribution. The goal is not to achieve equal life satisfaction or equal prosperity, but to ensure fair starting conditions that enable individuals to pursue their own life plans.

Collective theories view societies as associations of social groups or classes that differ in their relationships to means of production and resources. They reject universalistic, abstract principles, arguing instead that each community is the product of specific historical and cultural conditions. Therefore, there are no universal norms of justice; instead, context-dependent rules emerge that are derived from social practices and traditions. Justice is understood here in terms of the common good: What is socially just is what strengthens a community's cohesion and continued existence.

- According to **Michael Walzer**, the given context leads to different "spheres of justice". What is considered just therefore varies according to time and place. In addition, different social goods warrant different criteria. In other words, political power should not be distributed according to the same standards as economic resources.
- **Michael Sandel** emphasizes the importance of community and moral responsibility. For Sandel, justice and the common good are inextricably linked to belonging to a community that creates identity.

When reflecting on the introduction of an unconditional basic income, proponents of the various theories would arrive at very different conclusions – as shown in Table X.

Table 4.4: Evaluation of the introduction of an unconditional basic income, based on various theories of justice

Theories of justice	Is the idea of a basic income a good idea	Reasoning
Libertarian theories (Nozick, Hayek)	No	Social justice cannot be controlled centrally. The state should only assume minimal protective functions, and resources should be allocated via the market. Redistribution through taxes to finance a basic income is an encroachment on individual freedom and property rights.

Theories of justice	Is the idea of a basic income a good idea	Reasoning
Liberal theories (Utilitarianism, Contractarianism, Egalitarianism)	Yes/Maybe	From a utilitarian perspective, a basic income could increase overall utility (or benefit). Contractarianism (Rawls) also supports it, arguing that it strengthens equal basic freedoms. From an egalitarian perspective, a basic income can promote opportunities, but it is viewed critically because it emphasizes <i>equality</i> (i.e. that everyone receives the same) rather than justice in the sense of <i>equity</i> (i.e. that each person receives what they need). Additional measures would be necessary to ensure equity.
Collective theories of justice (Walzer, Sandel)	Depends on context	How this question is assessed depends on specific historical, cultural, and social conditions. A basic income could be considered socially just if it strengthens social cohesion and the common good.

While **theories of justice** are general frameworks or models that define what justice is and how it can be achieved in a society, **concepts of justice** focus more on specific aspects. As the overview in Box X shows, distributive justice issues can be viewed from a variety of different perspectives.

Note 2: Normative concepts of justice based on (Novy et al. 2023)

Market justice is based on the principle of supply and demand, meaning that income, goods, and opportunities are distributed according to market mechanisms. According to this framework, the price determines what is considered fair. Within neoclassical economic theory, market justice is measured by the marginal productivity of labour, i.e. how work contributes to maximizing profit. **Commensurability with performance** demands that remuneration be proportionate to an individual's contribution. Since people perform to different levels,

unequal pay is considered justified. The problem is that this principle fails to recognize key services – such as care work in the family – that aren’t valued on the market. Because performance is difficult to measure, this principle is often equated with market justice.[TH1]

Equality of opportunity aims to create equal starting conditions – i.e. without legal and cultural discrimination or barriers to market access – for example through anti-discrimination laws that prohibit discrimination based on gender, ethnicity, or religion.

Equality of needs ensures that basic needs are met – such as food, housing, or protection from poverty. It is aimed particularly at people whose needs cannot be met through market mechanisms. While commensurability with performance focuses on individual contributions, equality of needs is about the collective provision of basic needs.

Equality of participation expands on the concept of equality of needs and opportunities. It seeks to create equal opportunities to participate in and help shape social life – regardless of income. This includes access to education, health, work, culture, and political participation. Participation is seen as a prerequisite for achieving other basic needs such as health and autonomy.

Gender equality addresses the unequal starting and participation conditions that exist between genders. For example, to promote equality of opportunity, quotas are a way of redressing structural disadvantages for women. And to foster participatory justice, policies that create affordable childcare or care services can help alleviate the unequal burden of care work that disproportionately affects women.

Environmental justice emphasizes the fair distribution of environmental burdens and resources, as well as equal participation in environmental policy decisions. The term originated in the US as a response to the disproportionate placement of landfills and motorways near poor African-American neighbourhoods. The US Environmental Protection Agency (US EPA, 2015) defines environmental justice as the fair treatment and effective participation of all people – regardless of race, colour, gender, or income – in the design, implementation, and enforcement of environmental laws and policies.

Inter- and intragenerational equity are defined in the Brundtland Report (1987). Intergenerational equity refers to the balance between present and future generations, while intragenerational equity refers to the balance between the Global North and South. Both concepts emphasize that opportunities for participation must be balanced across time and space.

Climate justice is a specific form of environmental justice. It addresses the unequal consequences of climate change for marginalized and vulnerable groups, and seeks to promote the fair distribution of burdens and measures aimed at reducing emissions. The Paris Climate Agreement stipulates that both the Global North and South must share responsibility for reducing CO₂ emissions. However, the North bears a greater obligation due to historically higher emissions – and must therefore reduce its emissions faster than countries in Africa, Latin America, or Asia.

[TH1]Not really sure what this means? Can you clarify?

Weil Leistung schwer messbar ist, wird Leistungsgerechtigkeit häufig mit Marktgerechtigkeit gleichgesetzt.

4.7 Cultural Sustainability

Sustainability models (see e.g. Section 1.6), typically describe three dimensions of sustainable development: the environmental, the economic, and the social. Social sustainability – which was the focus of this chapter – often includes cultural aspects. However, there is growing debate as to whether culture should be understood as a fourth dimension of sustainability (Sabatini, 2019).

Although the term has not yet become firmly established in the political discourse or yet been clearly defined, it is gaining traction in academic debates and in policy programmes (Zheng et al. 2021). **Cultural sustainability** refers to both tangible and intangible cultural assets. However, it remains a challenge to implement. At a global level, UNESCO plays a key role in the protection of cultural heritage, working to preserve cultural diversity through various conventions and programmes. Today, there are numerous UNESCO World Heritage Sites that preserve culturally significant places. UNESCO also protects intangible cultural assets, for example through programmes to preserve endangered languages or traditional practices.

The cultural dimension of sustainability emphasizes the role of values, traditions, beliefs, and cultural practices in shaping sustainable development. Culture influences how societies respond to environmental, economic, and social challenges – and it provides the framework within which sustainable solutions can be understood, accepted, and implemented. Sustainable development must therefore consider not just technological and economic factors, but also the cultural context in which measures are implemented. Proponents of an independent view of cultural sustainability argue that culture is more than just a part of the social sphere: it shapes how people interpret the world, form identities, and understand their relationship to society and nature. Culture shapes values, traditions, language, and knowledge systems that extend beyond social structures. In addition, the preservation of cultural diversity is viewed as a goal in its own right, because culture significantly influences all other dimensions of sustainability.

Links to the other three dimensions of sustainability:

- **Culture and social sustainability:** Culture is a key means of shaping values, behaviours, and social assumptions. It influences the openness, inclusivity, and cohesion of societies, as well as respect for human rights, health, and quality of life. Culture provides orientation and conveys shared values such as trust, solidarity, the rule of law, and democracy – and thus creates the basis for individual and social development.
- **Culture and economic sustainability:** Culture and the economy are closely connected. As UNESCO emphasizes, cultural heritage, creative industries, sustainable cultural tourism, and cultural infrastructure not only contribute to economic development and poverty reduction – they also create social and identity-forming values, especially in countries with a rich cultural heritage and great cultural diversity.

- **Culture and environmental sustainability:** Cultural factors shape lifestyles, consumption patterns, and our relationship with the environment. Local and indigenous knowledge systems and traditional environmental practices offer valuable approaches to dealing with environmental challenges. They help to prevent biodiversity loss, reduce land degradation, and mitigate climate change.

4.8 Conclusion

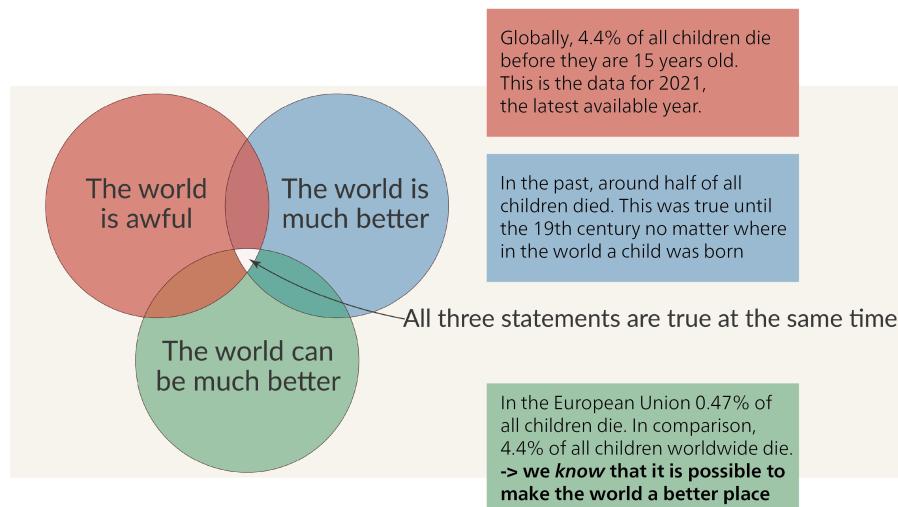


Figure 4.11: The world is awful. The world is much better. The world can be much better. All three statements are true at the same time. Source: adapted based on Roser (2022), <https://ourworldindata.org/much-better-awful-can-be-better>.

As Figure X shows, three seemingly contradictory statements can be true at the same time: In many respects, the world is awful. Nonetheless, it's become much better. And finally – it can be much better still. This perspective also provides a good basis for understanding social sustainability strategies.

1. “The world is awful”: Social ills persist.

Millions of people around the world are affected by poverty, hunger, discrimination, and a lack of participation. Inequalities between and within societies jeopardize cohesion, resilience, and justice. Strategies for social sustainability must clearly identify and address these problems.

2. “The world is much better”: Progress has been made.

Historical comparisons show that key social indicators have improved: lower infant mortality, higher literacy, growing social rights. These developments are proof that political action, social movements, and institutional reforms are working. Strategies for social sustainability can build on these successes.

3. “The world can be much better”: The potential is huge.

Inclusion, social cohesion, resilience, and procedural justice are the key levers for overcoming existing grievances. Strategies range from combating discrimination, expanding social security systems, and implementing participatory governance – to promoting education, health, and cultural diversity.

This perspective shows that social sustainability strategies must clearly identify grievances, build on progress made, and create new opportunities for greater justice.

It’s true that the challenges are immense. But we are not doomed. The progress we’ve already made demonstrates that change is possible. The key now is to act rapidly and on a large scale. As Hannah Ritchie (2024) notes, we often waste energy on internal conflicts among sustainability proponents, thereby benefiting opponents of the cause. We need systemic change and a meliorist ethic – a belief that the world can be improved step by step through conscious action. Instead of getting bogged down in internal disagreements, we need joint effort in the same direction – even if our paths and priorities vary.

In the end, however, it’s important to remember that strategies for social sustainability always require discussion. Who defines the boundaries of needs and desires, whose future vision of sustainable development should be pursued, what sustainability paths are favoured, and who is making these decisions? Also – who benefits from the chosen course, who bears the costs, and what distribution patterns result from this? The difference between needs and desires in particular shows how complex such discussions are: Needs are finite, universal, and indispensable for human well-being, like housing or food. Wants, on the other hand, are potentially infinite, subjective, and dispensable, like the choice of a particular brand of shoe. As Swiss politician Jacqueline Badran said in an interview: “You can’t not have a place to live. It’s different from trainers, where you can say: Adidas is too expensive for me, so I’ll buy another brand. You can’t do that with housing.” (Badran, 2023). This example demonstrates that the debate about social sustainability is not just about abstract principles; it’s about the concrete, existential questions of life.

Such questions cannot be answered technocratically. Instead, they require open, fair, and inclusive negotiation processes. Strategies for social sustainability must therefore not only develop concrete solutions to injustices – they must also create spaces in which these discussions can be held.

Chapter 5

Economic Sustainability



Figure 5.1: Economic Sustainability. Source: Own illustration.

Economic sustainability is a profoundly normative concept: it asks what understanding of the economy is socially desirable, what goals economic activity should pursue, and what role people, society, and natural resources should play in this. Contrary to widespread belief, economic theories are not value neutral. Instead, they are normative and performative, shaping ideas, actions, policies, and – ultimately – reality. This is

why answers to the central questions of economics – i.e. who produces and consumes what and why, how are profits distributed and what are they used for – differ depending on the economic theory.

Defining rent, profit, and wages

“The produce of the earth – all that is derived from its surface by the united application of labour, machinery, and capital, is divided among three classes of the community, namely, the proprietor of the land [**Rent**], the owner of the stock or capital [**Profit**] necessary for its cultivation, and the labourers by whose industry it is cultivated [**Wages**]. ...To determine the laws which regulate this distribution, is the principal problem in Political Economy.”

Preface, p. 1 – David Ricardo: The Principles of Political Economy and Taxation (1821)

5.1 Economics as a performative science

From the very beginning, modern economics has not just observed and described social reality – it has also helped shape it. This discipline has formed our thinking about what is considered “economic” – e.g. through the ideal of the rationally deciding homo economicus, the norm of profit maximization, the focus on efficiency, or the idea that growth is synonymous with social progress (cf. Bontrup and Marquardt 2021, pp. 1–40).

These interpretations never remained purely theoretical. They continue to influence policy and practice to this day: from structural change to the market liberalization that took hold in the 1980s – to the shaping of climate policy through emissions trading systems and the construction of highly complex financial products. The history of economics is therefore also a history of its impact (Schneidewind et al. 2016). The most widely accepted definition of economics, originally coined by Lionel Robbins, focuses on the relationship between resource scarcity and the satisfaction of people’s needs:

“Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternatives uses.” (Robbins 1932, p. 15).

Robbins’s definition is influenced by his theoretical orientation towards neoclassical economics, the school of thought that came to be considered mainstream economics. Extending this concept, most textbooks define economics as a science of (rational) decision-making that explores how people decide to use scarce resources to achieve their aims.

Homo economicus as the foundational model of human behaviour

Homo economicus, or “economic man”, is a foundational model in neoclassical economics. It describes humans as rational, utility-maximizing actors who have access to comprehensive information and consistently make decisions to enhance

their material well-being. This view of humans was decisive for the development of mathematical models in economics and the idea that markets can efficiently lead to optimal outcomes.

Historically, this concept developed over several stages. While early economists like Adam Smith still assumed a more complex view of humans – one that also included moral and social dimensions – this was increasingly reduced to purely rational, calculating behaviour in the Marginal Revolution of the 19th century. This reduction made it possible to model economic processes mathematically, but it also led to a problematic abstraction of actual social, environmental, and psychological conditions.

Critics emphasize that *homo economicus* is a normative construct, and not a purely analytical one. It conveys a specific idea of humans as portrayed in social models and institutions, one that regards competition, personal responsibility, and increased efficiency as natural principles. In the real world, however, people often don't behave purely rationally. Instead, factors like cooperation, fairness, trust, and even cognitive biases shape their decisions.

The *homo economicus* model is particularly relevant to the discussion on sustainable development. It contributes to obscuring the systemic causes of environmental destruction and social inequality, as it systematically ignores structural power relations, external effects, and long-term planetary boundaries.

The heterodox economist Ha-Joon Chang criticizes Robbins's definition as being too specific and as emerging from a theoretical approach, which subsequently causes it to prescribe a particular direction (Chang 2014). Chang defines economics not through a theoretical approach, but by its object of study: the economy. Economics is therefore the study of everything related to (re-)production, exchange, and distribution of goods and services for the satisfaction of human needs. There are of course many other definitions of economics. Building on these diverse understandings, various schools of thought consequently differ in their focus of study, which may include power structures, institutions, or macro-economic and social connections and structures (cf. Miyamura 2020; Newman 2020; Robertson 2020).

Economic sustainability requires that we systematically consider the consequences of economic activity on humans and nature. This includes asking questions about distribution. Who bears the costs of growth, and who benefits? How much material accumulation is enough? And who decides?

An understanding of sustainability that takes these questions seriously focuses on concepts like sufficiency, minimum social standards, and planetary boundaries. It requires a departure from the dogma of a focus on growth (which primarily views growth as measured by Gross Domestic Product, see chapter 5.2.3. on Economic Growth) towards a normatively grounded, reflexive, and pluralistic economy. Such an orientation cannot be achieved by economics alone – it must emerge as a democratic practice in dialogue with ethics, other social sciences, and environmental sciences.

Plural economics

Contemporary economics is largely dominated by one school of thought: neoclassical economics. At most universities and in most contexts, the term “eco-

nomics” implicitly refers to this school of thought. Neoclassical economics forms the core of mainstream economics, based on the understanding of economics as formulated by Lionel Robbins. Accordingly, this school of thought examines the allocation of scarce resources and goods based on decisions made by rational, utility-maximizing individuals. The price mechanism serves as the key instrument of allocation. Supply and demand determine the optimal market price, which then ensures the optimal allocation of resources and goods.

Plural economics emphasizes that there isn’t just “one” economics, but a variety of schools of thought. These include feminist, post-Keynesian, ecological, or Marxist economics, all of which differ in their theoretical assumptions, methods, and objectives. As a result, they often reach different, sometimes complementary, and at other times contradictory conclusions.

However, this is not about a wholesale rejection of neoclassical economics. Instead, the key lies in discerning which perspective best suits a given question. Neoclassical analysis provides useful insights into markets, price formation, and incentive structures. However, its utility is limited when it comes to non-monetary processes, power relations, or social reproduction work. For example, its focus on market-based exchange relationships and price mechanisms makes it difficult to take unpaid work into account. This is where alternative approaches such as feminist economics come in, as they systematically incorporate care work, social relations, and power structures into economic analysis. Consequently, plural economics advocates a methodologically open, problem-oriented approach, viewing the diversity of theoretical approaches as an enrichment – especially given the complex challenges of sustainable development.

While a detailed exploration of neoclassical economics and other schools of thought is beyond the scope of this discussion, you can delve deeper into this topic in our *Introduction to Sustainable Economics* course. More information on plural economics is also available on the *Exploring Economics* e-learning platform.

In this video – *Economics is for Everyone* – Ha-Joon Chang provides a clear and concise introduction to the idea of plural economics. He explains why economic thinking is never neutral – and why we urgently need more economic pluralism.

5.2 Key elements of economic sustainability

Sustainability in the economic dimension means designing economic activities to meet human needs in the long term – for current and future generations – while respecting planetary boundaries and maintaining fair social structures. Economic activities are processes that convert natural resources into goods and services for consumption, using additional production factors such as labour and capital.

In economic theory, the result of production represents a *value*. But what is the understanding of value on which this assumption is based? Historically, the concept of value in economics has undergone several fundamental changes (cf. Mazzucato 2018). As early as the 17th century, economic activity was often understood as serving the common good, especially when it contributed to security of supply or social stability. This understanding was closely linked to the idea of a “moral economy” (cf. Thompson

1971), which saw economic activity as embedded in traditional norms, expectations of justice, and social obligations.

The rise of merchant capitalism and colonial expansion shifted the focus of economic value attribution. During this time, wealth was increasingly epitomized by gold, silver, and other precious metals. Proponents of “mercantilist” policies – a term coined retrospectively to describe the prevailing economic practices of the 16th to 18th centuries – regarded trade as the main source of national prosperity. Traders and merchants were therefore considered “productive”, while workers and soldiers were classified as “unproductive”.

The Industrial Revolution in 18th and 19th-century Britain again reshaped the economic understanding of value: now, *labour* was considered the main source of value creation. Classical economists such as Adam Smith, David Ricardo, and Karl Marx advocated an objective theory of value, asserting that a good’s value is fundamentally determined by the labour invested in its production. These thinkers distinguished between two key concepts: use value (the practical utility of a good) and exchange value (the value that a good achieves in exchange on the market). While use value relates to the satisfaction of needs, only labour was considered the source of economic value. Adam Smith notably highlighted the division of labour as a key factor in economic progress: he argued that specialization and the functional breakdown of production processes allowed the same amount of labour to generate significantly greater output. This, in turn, spurred productivity, innovation, and ultimately, economic growth – dynamics which were further amplified by mechanization and technological innovations.

Then, in the late 19th century, yet another understanding emerged. This was the subjective theory of value, which posits that the value of a good is derived from the individual utility consumers attribute to it – irrespective of production costs or working hours. This view continues to shape neoclassical economics today, modelling economic processes as rational exchanges between producers and consumers.

This is also the basis for the simple economic cycle, which reduces the complex processes of an economy to two main actors – households and businesses – and two main flows – goods/services and money. Households provide businesses with their labour in exchange for income; businesses in turn use this labour and other factors of production to produce goods and services, which are then consumed by households. Expanded economic cycles include other actors such as the state, banks, and foreign trade.

5.2.0.1 Critique of conventional economic cycle analysis

Conventional analyses of the economic cycle typically depict the market economy as a value-creating unit, with households portrayed primarily as consumers. Large parts of society – especially unpaid work and processes of (re-)production outside of the market logic – are largely ignored and thus implicitly devalued. Feminist economics, therefore, complements its depiction of the paid economy by including unpaid areas (see e.g. Elson 2000). Nonetheless, Mariana Mazzucato (2018) reminds us to always consider the social context in which such models emerge:

“It is crucial to remember that all types of accounting methods are evolving social conventions, defined not by physical laws and definite ‘realities’,

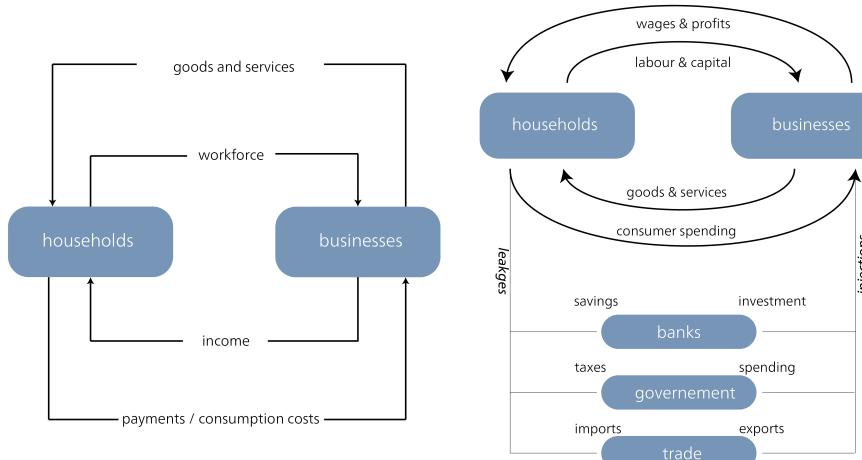


Figure 5.2: **Basic economic cycle** – Flows

of goods and money between households and businesses: labor in exchange for income, consumer spending in exchange for goods.

Figure 5.3: **Extended economic cycle** – and businesses: labor in exchange for income, consumer spending in exchange for goods. Includes banks, government, and foreign trade, showing how savings, taxes, and imports act as leakages, while loans, government spending, and exports function as *injections*.

Source: Own illustrations based on ...?

but reflecting ideas, theories, and ideologies of the age in which they are devised.” (Mazzucato 2018: 76)

This allows us to understand why Paul Samuelson’s famous circular flow diagram of the late 1940s – influenced by the experiences of the Great Depression and the Second World War – focused largely on the uninterrupted flow of income to promote economic growth. Subsequent models of the economic cycle therefore focused almost exclusively on the flow of money between households and companies.

In contrast, Kate Raworth (2017) illustrates the economy as embedded in society and the environment. She depicts households, the market (companies), states, and the commons as interacting with one another, and explicitly considers ecological boundaries. This more holistic understanding is key to rethinking economic activities in terms of sustainable development.

Work is more than paid work

Work is a central production factor of each economy and necessary for transforming natural resources into goods and services. How this work is organized has varied throughout history, depending on the available tools and technologies as well as on the existing forms of organization and governance. Work is therefore context-dependent.

Neoclassical economics typically focuses on paid work, which only attained its

key position in industrial capitalism in the 19th century and consolidated it in the 20th. Unpaid work (e.g. domestic, care, nursing, voluntary), which is typically carried out by women, is largely ignored or taken for granted. The number of unpaid hours has been recorded in Switzerland since 2000, revealing that the amount of time spent on unpaid work exceeds that of paid work (FSO, Household production satellite account 2020).

From the perspective of economic sustainability, this narrow approach is problematic. After all, work is not just an input factor, but constitutes economic activity itself – it enables production, reproduction, and social participation. A sustainable economy therefore requires a wider understanding of work, one that gives equal consideration to both paid work and unpaid reproductive work.

5.2.1 States, markets, and networks

Economic systems differ according to how they answer fundamental questions such as this: “Who produces what, why, and for whom?”. The two key dimensions here are ownership (private or public?) and coordination (centralized or decentralized?). From an “ideal-typical” perspective, the following basic forms emerge (Basseler 2002):

- **Capitalist market economy:** Here, coordination is decentralized through markets, driven by the interplay of supply and demand (“bottom up”). The means of production are predominantly privately owned.
- **Socialist, centralized economy:** In this model, production and distribution decisions are centrally controlled through state planning (“top down”). The means of production are generally publicly owned.
- **Mixed economy (e.g. welfare state):** These systems combine private ownership of the means of production with state coordination in key areas. While resource allocation is largely decentralized via markets, the state intervenes to regulate and distribute them – for example through social insurance, public services, or progressive taxation policies. This model aims to correct market failures and promote social justice. Coordination is therefore partly decentralized via markets and partly centralized via political institutions.
- **Community-based networks and commons economies:** These focus on self-organization, decentralized cooperation, and common property. Examples include solidarity economies, cooperatives, and communally managed resources (commons).

Historically, industrial capitalism was – at least initially – the predominant model following the Industrial Revolution. It took on various forms in the 20th century, from the strong national welfare state of the postwar period to the market-oriented globalization models that have prevailed since the 1980s. Hall and Soskice (2001) describe these as “varieties of capitalism”.

Today it's easier to imagine the end of the world than the end of capitalism, as Slavoj Žižek (1994, S.1) puts it. And yet, increasingly, alternatives are emerging that show that a solidarity-based economy does not have to be limited to local niches. Instead, such

an economy can be imagined and shaped globally, and move beyond market-centred or state-dominated paradigms. Networks, commons, and alternative economic forms are gaining attention, as they open up new ways of organizing economic processes in a more democratic, resilient, and environmentally sustainable way. For example, in *The Zero Marginal Cost Society*, Jeremy Rifkin (2014) envisions collaborative commons – jointly managed resources made possible by digital platforms and decentralized cooperation.

5.2.2 Capitalism as the starting point for economic sustainability issues

Many sustainability challenges – e.g. the climate crisis, social inequality, resource overuse, financial market turbulence – are not isolated phenomena. They’re an expression of an overarching context, i.e. the structural dynamics of modern global capitalism. This textbook therefore takes a systemic perspective, as adopted by academics like Polanyi (1944), Brand and Wissen (2017), Hickel (2020), Seidl and Zahrnt (2010), Schneidewind (2016), and Binswanger (2006). From this perspective, moving towards sustainability requires an examination of our underlying economic structures and their political and cultural prerequisites – and thus of the capitalist system of today.

In this textbook, we view capitalism not just as an economic system, but as encompassing the current economic and social system in its entirety. This includes economic, social, legal, cultural, and environmental structures and dynamics, all of which interact (see Box). Capitalism is not a natural state of economic activity, but rather the outcome of a specific historical development. Its roots go back to late medieval Europe, particularly England, where key institutional foundations were laid through the appropriation of land (a practice known as “enclosure”), the emergence of a free labour market, and early forms of capitalist agriculture (see Wood 2015).

The Industrial Revolution in the late 18th and early 19th centuries ultimately enabled the historic breakthrough of capitalism: technological innovations, fossil fuels, and extensive capital investment gave rise to a new production system based on mass production and mass consumption. This process consolidated earlier developments into a dominant economic and social system that still characterizes key global structures today.

This system is known as the capitalist mode of production, and its underlying logic is characterized by three basic features:

- the separation of capital and labour, so that workers generally don’t own the means of production and are therefore forced to sell their labour for wages
- private ownership of the mean of production
- the orientation towards profit maximization and profit utilization

Capitalists – as owners of the means of production – bring together capital, land, and labour to produce goods and services in a production process. The aim is not primarily to satisfy needs, but to generate an exchange value that can be achieved on the market – with the main purpose of increasing capital. The accumulation of capital is the key

driver and structural logic of the capitalist mode of production. A key characteristic of this process is the generation of surplus value, which is the economic value workers create in production that exceeds their wages. This surplus value forms the basis for profits and is distributed in various ways:

- One part goes towards workers' wages
- One part goes to owners of land or natural resources as ground/land rent
- One part goes to the financial sector as interest and financial rents, especially where the capital is funded through debt
- The remaining surplus value comprises the profits, which can also be complemented through monopoly rents (e.g. through market power) or brand rents (e.g. through intangible assets such as reputation)

Reducing unit costs plays a key role in making production profitable and ensuring competitiveness. Technological innovations and investments in machinery, factories, and infrastructure significantly increase productivity. Energy is increasingly replacing human labour; standardized production processes like the assembly line boost efficiency and enable the mass production of inexpensive consumer goods. As Henry Ford is reported to have pointedly said: "Any customer can have a car painted any color that he wants, so long as it is black."

But achieving a profit requires more than just technological efficiency. Other critical factors include control over markets and value chains, access to cheap resources, the ability to discipline and control labour, and the design of institutional and policy frameworks. This means that profits are created on the back of unequal power relations between companies and workers, between global centres and peripheries, along supply chains, and within ownership structures.

Ensuring that the vast quantities of goods produced can also be sold requires homogeneous mass demand. This is fostered through rising wages, a culture of consumption, and a social model that equates the possession of standardized consumer goods with prosperity and social advancement.

What is capitalism?

Capitalism is a historically developed form of society where production is primarily for the market, private ownership of the means of production predominates, and the accumulation of capital is essential. Its fundamental dynamic is the use of capital: money (M) is invested in goods or commodities (C), which are then sold for a profit, resulting in more money (M') as described by Karl Marx.

The capitalist mode of production is based on the separation of labour and the means of production. This means that people have to sell their labour to gain access to resources. This logic creates structural dependencies that extend beyond the economic system into all areas of society.

Historically, capitalism did not establish itself "naturally", but was enforced through processes of political expropriation, colonial expansion, and legal transformations (e.g. abolition of the commons, monetization of labour, compulsory schooling for discipline).

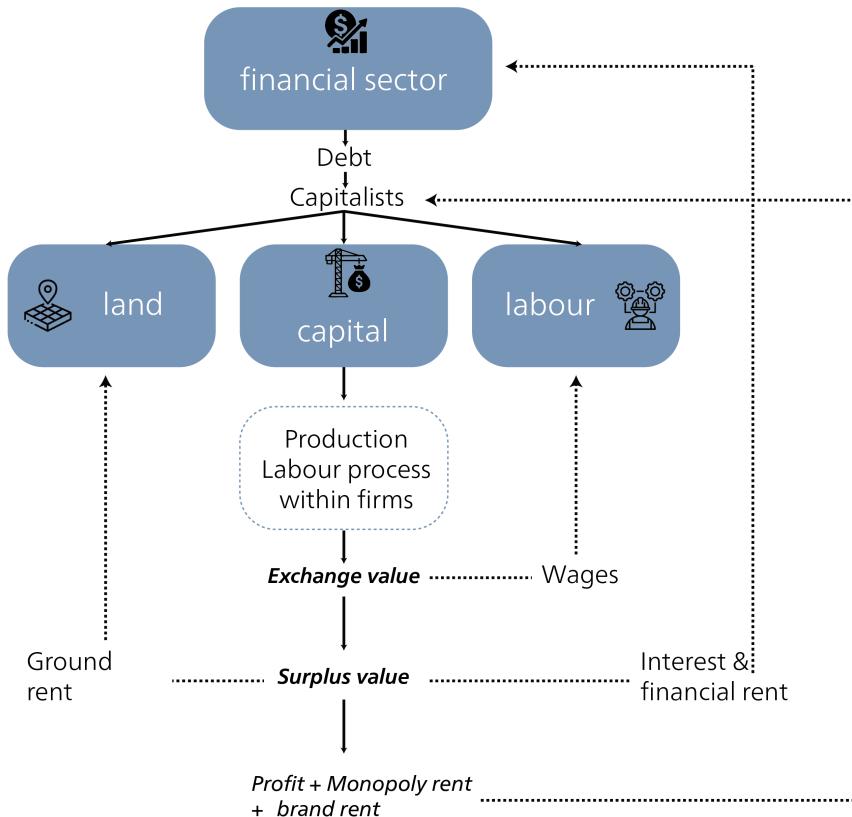


Figure 5.4: Capitalist mode of production and distribution of surplus value. The surplus value created by workers is generated in the production process and skimmed off as profit, rent, or interest. Capitalists pursue the aim of increasing capital by combining capital, land, and labour, and with the support of lending from the financial sector. Source: own illustration, adapted from Varoufakis (2024).

Figure 5.4 illustrates how the capitalist production system produces not only goods but also social relations. In other words, those with access to capital or land can skim off surplus value, while those who only own their labour usually only receive wages. The financial sector plays an increasingly significant role in this by organizing capital flows and gaining additional access to the production process through debt (see 6.2.5 Financialization and financial crises). This mode of production therefore has an impact far beyond the economic sphere. The Hungarian economic sociologist Karl Polanyi described this process as the transition to a market society: a society in which the markets are no longer embedded in social and political relationships but increasingly determine these themselves. Labour, land, and money became “fictitious commodities” (Polanyi 1944) – i.e. goods that were not originally intended for the market but are now subject to its logic. In a market society, markets are not part of society – society is part of the mar-

ket. According to Polanyi, this leads to profound social upheavals – e.g. in the form of social insecurity, ecological degradation, or growing inequality – and repeatedly gives rise to counter-movements. This dynamic is closely linked to two key mechanisms of capitalist expansion: internalization and externalization. On the one hand, resources such as nature, labour, or knowledge are appropriated without a market-mediated exchange (internalization). On the other, social costs are outsourced to third parties, such as future generations or countries in the Global South (externalization). A more detailed explanation of these two terms can be found in the box titled “Internalizing and externalizing”.

In the following sections, we analyse how the capitalist mode of production, embedded in a market society, necessitates structural growth and thus leads to significant conflicts with sustainability.

Internalizing and externalizing

The price of a good doesn't always reflect its actual social costs. If a good is produced or sold at a market price that ignores these costs, they are often passed on to third parties – such as taxpayers, future generations, or the environment. These are known as external effects or externalities, and they can be either positive or negative. Externalities influence the production and consumption options of uninvolved parties.

Neoclassical economics generally views external costs as an anomaly within an otherwise efficient market. The usual remedy is to “internalize” these costs – e.g. through mechanisms like a carbon taxes. In contrast, William Kapp argued as early as 1950 that the more a system prioritizes private profit maximization, the greater the incentives to pass costs onto people, society, and nature (Kapp 1950). Therefore, the current capitalist system has an inherent tendency to externalize costs. Stephan Lessenich describes the affluent societies in the Global North as externalization societies that outsource costs to the Global South (Lessenich 2020). At the same time, the capitalist mode of production relies on processes of internalization: nature, labour, or knowledge are often appropriated without compensation, based on structural power relations. Examples include land grabbing, unpaid care work, and the commodification of traditional knowledge (see e.g. Saave 2022).

While liberal market theories emphasize the importance of price signals, other schools of thought question whether we really need to assign a price to everything, even nature. These fundamental debates are key to achieving a sustainable economy and are examined in depth in the *Introduction to Sustainable Economics* course.

Further readings

- Karl Polanyi (1944): *The Great Transformation* • Ellen Meiksins Wood (2015): *The Origin of Capitalism: A Longer View* • Maja Göpel (2016): *The Great Mindshift*, Chapter 3

5.2.3 Economic growth: emergence, normalization, and criticism

Today, we take economic growth for granted, yet from a historical point of view, it is a recent phenomenon. For centuries, the level of economic production remained largely stable. It was not until Britain's Industrial Revolution at the end of the 18th century that a slow increase began, picking up speed significantly from the 1950s onwards. Figure 5.5 impressively illustrates how sudden and historically unique this acceleration was. For many centuries, per capita income stagnated before it literally exploded with the rise of industrial and fossil-fuelled production methods. However, this growth was concentrated mainly in some countries of the Global North. Three factors were key to this dynamic:

1. Reconstruction after the Second World War enabled massive public and private investment.
2. Access to cheap fossil fuel – especially oil – from the Middle East dramatically reduced production costs.
3. The Fordist consumer model combined high wages with cheap mass production: Henry Ford's vision of "cars for everyone" became the guiding principle of a new production and consumption logic.

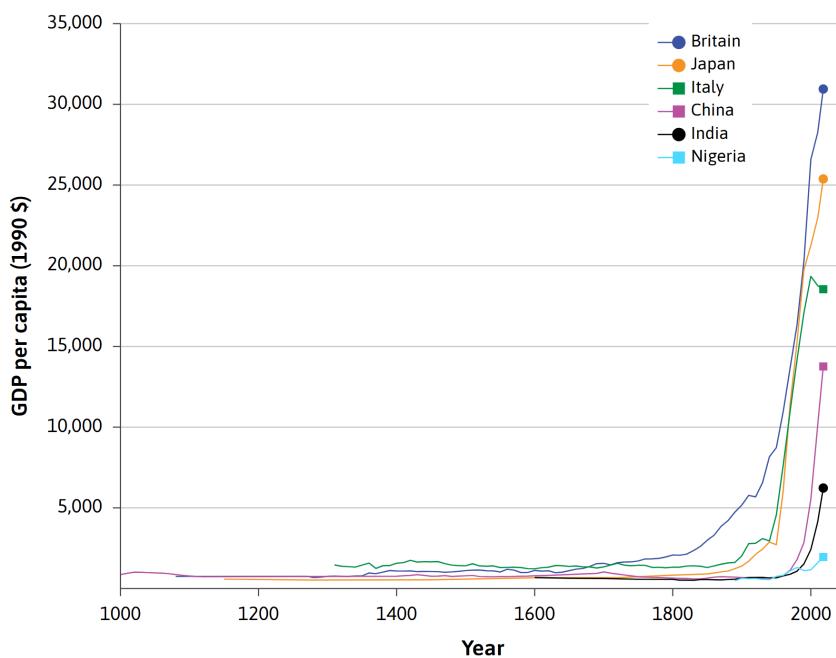


Figure 5.5: History's hockey stick: gross domestic product per capita in five countries (1000–2018). Per capita income stagnated for centuries. It was only with the Industrial Revolution and fossil capitalism that income and production volumes rose exponentially – albeit very unevenly from region to region. Source: <https://books.core-econ.org/the-economy/microeconomics/01-prosperity-inequality-02-historys-hockey-stick.html#figure-1-1>.

A key turning point was that capital replaced land as the central factor of production. While land is naturally limited, capital – understood as machines, technology, and infrastructure – initially had no obvious limits. For economists like Malthus, who still assumed that natural resources were scarce, long-term growth was almost unthinkable. Industrial production under capitalist conditions fundamentally altered this paradigm.

Economic growth led to **gross domestic product (GDP)** taking centre stage as the predominant measure of prosperity. GDP measures the monetary value of final goods and services produced in a country in a given period of time (e.g. a year), but it doesn't measure unpaid labour, ecological damage, or social justice. Since the 1980s, there has also been a divergence between rising GDP and stagnating subjective life satisfaction. GDP is well-suited to describing market activity – but not as a comprehensive indicator of prosperity or well-being.

After World War II – during the *trente glorieuses*, or “glorious thirty” (1945–1975) – steady economic growth became the new normal. During this time, a frequent topic of discussion was whether increasing prosperity could, in the long term, lead to environmental improvement. The Environmental Kuznets Curve (Stern 2004) suggests that environmental degradation initially increases in the early phases of economic growth but begins to decrease once a certain income level is reached, as societies invest more in environmental protection. However, empirical evidence for this theory is mixed. While some local environmental issues have been managed, global environmental impacts such as CO₂ emissions continue to increase. Simply continuing to grow the economy therefore by no means guarantees reduced pressure on the environment and can further exacerbate existing planetary boundaries (Wiedmann et al. 2020). Many social subsystems, such as social security systems or labour market policy, were designed and structured to expect continuously growing government revenue, investment, and employment. This structural focus on growth continues to have an impact today, making economic sustainability a systemic issue.

5.2.4 Growth dependency and structural growth constraints

As the current capitalist economic system is structurally dependent on growth, a decline in economic activity (e.g. stagnation, recession, or even depression) would lead to an economic crisis with far-reaching consequences for the population (e.g. unemployment, poverty, social benefit cuts) (Schmelzer and Vetter 2019, p. 26). Without growth, the system would enter a state of crisis. Currently, there is either growth or shrinkage, but nothing in between. Matthias Binswanger (2019) demonstrates that the need for growth results from the dynamics of market competition: to remain competitive, companies must continuously expand and boost productivity – otherwise, they risk losing market share and profits, or even risk going out of business. This growth imperative is evident on a macroeconomic, corporate, and cultural level:

The **macroeconomic growth imperative** describes the structural dependence of modern societies and economic systems on economic growth. This growth is currently necessary because many core institutions and systems – such as labour markets, social systems, and public finances – can only function stably if there is continuous growth. For example, it is argued that without constant growth, unemployment would rise, as companies reduce production and, consequently, their workforce. Public finances would also be affected: state budgets, pensions, and social security systems are often based

on continuously rising revenues generated by taxes, which in turn rely on economic growth. Last but not least, growth prevents economic and political crises, as stagnating or shrinking markets can be accompanied by uncertainty, capital flight, and social dissatisfaction, all of which facilitate political instability (Seidl and Zahrnt 2010).

The corporate logic of investment, profit, and expansion. Companies operate within a capitalist mode of production whose logic is based on continuous growth. This growth is not only desirable – it is also structurally enforced. Companies typically invest only where they expect a profit – a principle reflected in the M–C–M' formula (money–commodities–more money). This dynamic is intensified by market pressure: to remain competitive, companies must expand – or risk collapse. This “grow or die” logic is further exacerbated by the financial system. Invested capital is expected to yield continuous returns, earning interest. To fulfil these expectations, companies must constantly generate demand and invest in new production cycles (see Binswanger 2019). Companies that fail to generate profits in the long term disappear from the market. If average profits across the economy fall short, this can trigger a chain reaction of business closures – with potentially severe implications for employment and social stability.

A concise introduction to the logic of capitalism is provided by David Graeber in this short video:

<https://www.youtube.com/watch?v=QOVnb3y8hm4>

Mass consumption and social norms: The growth spiral of the capitalist production system is driven not only by technological and economic factors, but to a significant extent also by cultural dynamics. Today, consumption is no longer just about satisfying immediate needs – it also fulfils a variety of social functions and has become an expression of status, self-realization, and belonging. As described in the previous section – and according to a key insight of Keynesian economists – mass demand stimulates investment, which in turn creates the basis for capitalist profits at a macroeconomic level. These connections illustrate the key role of consumption in the capitalist production system: In other words, strong consumer demand is essential for sustained economic growth. A lack of demand – e.g. if real wages stagnate or fall – would destabilize the capitalist system. In recent decades, various strategies were implemented to compensate for such shortfalls in demand:

- **Integrating women into the labour market:** In many countries, particularly in the US, women's access to the labour market increased significantly in the 1970s and 80s. This not only served to promote equality – it also helped maintain household purchasing power – as reflected in popular cultural representations of the situation, such as Dolly Parton's hit song, “9 to 5”.
- **Increasing consumption on credit:** As there are natural limits to both workers and daily working hours, consumption on credit increased. Just as private households borrowed money to make up for a lack of purchasing power, so too did the state: public spending on e.g. infrastructure, social benefits, or tax relief in the 1980s was often financed through state debt to stabilize overall economic demand. The deregulation of financial markets further fuelled these developments. Since the 2008 financial crisis, central banks have also played an increasing role in stabilizing demand through monetary policy measures like low interest rates and bond purchases.

- **Combating consumer saturation:** In affluent societies, where many basic needs have already been met, the advertising industry is faced with the challenge of creating new areas of consumption. It's increasingly about creating needs rather than fulfilling them. As economist Mathias Binswanger (2019) sums up: "We have evolved from a need fulfilment society to a need creation society," adding: "*Until a few years ago, people didn't realize that they needed to record their daily heart rate, activities, calories burned, and sleep. But thanks to the efforts of health watch manufacturers, this need has been 'awakened' in them and health watches and fitness trackers are now sold in large quantities.*"

5.2.5 Financialization and financial crises

Initially, the financial – both money and capital – markets were closely tied to the real economy, providing liquidity for the production of goods and services. It was therefore assumed that these two – financial markets and the real economy – would develop roughly in tandem. However, this stopped being the case several decades ago. From the 1980s onward, money and capital markets have grown much faster, losing touch with the real economy.

One reason for this development was the deregulation of international financial markets. These deregulatory measures were introduced in the 1980s and 1990s to stimulate stagnating economic development in countries like the UK (then led by Conservative Prime Minister Margaret Thatcher) and the US (under President Ronald Reagan, the original proponent of the "Make America Great Again" slogan). The measures were legitimized by the argument that previous crises stemmed from inefficient state regulation and intervention, which were said to have prevented the rationality of individual market participants from achieving market equilibrium. The extensive deregulation of the financial markets was intended to enable self-regulating mechanisms for economic stabilization. Deregulation involved repealing the 1933 Glass-Steagall Act, which had mandated a strict separation of credit and securities transactions. This allowed banks to conduct both businesses simultaneously, which strongly facilitated speculative activities. Speculative trading volumes subsequently skyrocketed after the turn of the millennium, amid the advent of computerized high-speed trading.

What we need to understand about money and debt

Money is far more than just a neutral medium of exchange. It fulfils four central functions in modern economic systems:

Medium of exchange: Money simplifies economic transactions by eliminating the need for simultaneous exchange of goods and services.

Store of value: Money can be saved and used later, which enables long-term planning and investment.

Unit of account (value meter): Money determines the "worth" of labour. However, this valuation is not an objective measure, but an expression of social power dynamics and ideologies.

Enabler of capital accumulation: In capitalism, money is invested to generate more money. This dynamic, if unchecked, can lead to an increasing concentration of wealth.

Through this last function, money is closely linked to debt: in today's financial

system, most money is not created through government coinage or central bank activities, but through the granting of loans by private commercial banks. This means that whenever a loan is granted, new money is created – along with a corresponding debt. Thus, every asset on the credit side has a debt on the debit side (see Graeber 2012). Without ongoing debt, there would be no money growth – and therefore no asset growth. This applies to both private households and governments. In a system of growing inequality, debtors are often structurally disadvantaged – they are dependent on lenders and subject to austerity measures and political constraints.

Today's financial system thus creates not only economic but also political dependencies. Those who have money can not only consume, they also have power – and can exercise it e.g. through political influence, media ownership, or strategic investments. Financialization, speculation, and global capital flows further exacerbate this development.

“The flipside of private wealth accumulation is public and private debt. Debt can only be reduced if assets are reduced at the same time.” (Holzinger 2024: 89, own translation)

Deregulation and its consequences enabled banks to significantly expand their lending – increasingly also targeting households with low credit ratings (i.e. limited repayment ability or low creditworthiness). To mitigate the associated risks, the loans were bundled and resold as seemingly safe “subprime” bonds. Such mechanisms ultimately laid the foundations for the financial crisis of 2008, when it emerged that a large proportion of these financial products were based on high-risk lending.

This shift in economic dynamics and power towards the financial sector is known as financialization. It created a power complex comprising central banks, commercial banks, other financial institutions, private pension funds, and the owners of various assets. In this process, financial markets grow disproportionately compared to the real economy, a trend facilitated by national deregulation measures. Financialization intensifies the growth imperative, increasing not just inequality but also ecological fragility, for example through speculative investments in resources, raw materials, or land. Examples such as derivatives trading in food or resources (link to CDE research) show how financialized markets can exacerbate social vulnerabilities and ecological risks.

What are derivatives and how do they contribute to financialization?

Derivatives are financial instruments whose value is derived from the future rates or prices of other goods, assets, or reference values such as interest rates, commodity prices, or stock market indices. Common derivatives include options, futures, and swaps. Derivatives trading does not involve real economic production – no goods or services are created. Instead, derivatives were originally intended to “hedge” against price fluctuations, e.g. in commodities trading. However, the increasing deregulation and technologization of the financial markets led to the widespread use of derivatives as speculative investment tools. This significantly contributed to the decoupling of the financial markets from the real economy, fostering a massive market for financial bets often vastly exceeding the real economic values on which the derivatives are based. This dynamic is a key com-

ponent of “financialization” and increases economic instability as well as social and ecological risks.

Further reading

Blakeley, Grace. 2019. *Stolen: How to Save the World from Financialisation*. Repeater.

5.2.6 Companies as key players in economic sustainability

Companies play a key role in economic processes: they produce goods and services, create jobs, and drive innovation – all the while being significant sources of environmental harm. In the context of economic sustainability, therefore, we should view companies not just as part of the problem, but also as part of a possible solution (Hoffmann 2018).

Companies are organizations that combine production factors (labour, capital, land) to produce goods and services, typically for sale in the market. Traditionally, their overriding goal has been to generate more income than expenses, thereby making a profit. This classical understanding was heavily influenced by the “shareholder doctrine”, notably articulated by Milton Friedman in his much-cited 1970 essay in the New York Times, “The Social Responsibility of Business is to Increase its Profits”. Friedman argued that the only social responsibility of a company was to maximize profits for its owners – the shareholders – within the bounds of applicable laws and market rules. Managers, therefore, owe primary allegiance to shareholders, but not to social or ecological objectives. This view formed the basis for many economic policy models and management practices in the latter half of the 20th century. It contributed significantly to companies’ strong focus on short-term returns, increased efficiency, and cost reduction – often at the expense of social justice or ecological sustainability. Critics contend that this logic systematically ignores crucial social and planetary boundaries, shifting responsibility primarily to individuals or states.

In the context of sustainability, this narrow focus is under increased scrutiny. Alternatives like the “stakeholder approach” are gaining importance, viewing companies not only as profit maximizers for owners but also as socially embedded actors responsible to diverse stakeholders, including employees, customers, suppliers, local communities, and the environment. Companies also vary significantly in size and organizational form, encompassing small and medium-sized enterprises (SMEs), large corporations, social enterprises, cooperatives, and other alternative business models. This diversity profoundly influences how sustainability is strategically embedded and practically implemented.

Dyllick and Muff (2016) categorize companies into three stages of development, based on their position on sustainability. The first stage, “business-as-usual”, describes companies that largely ignore sustainability and focus their economic activities exclusively on financial objectives. In the second stage, “Corporate Sustainability 1.0 and 2.0”, companies begin to address sustainability through efficiency improvements, compliance (i.e. adherence to legal and regulatory requirements), and the integration of corporate social responsibility (CSR) into their business strategies. However, this typically

occurs without fundamentally changing the core business logic. Only in the third stage, “Sustainability 3.0”, does systemic transformation of the company take centre stage. Here, companies follow a broader purpose: they explicitly commit to social well-being and to respecting planetary boundaries, comprehensively integrating these goals into their core business model.

The third stage requires a fundamental change in perspective: while companies in the earlier stages primarily acted from the inside out by slightly adapting their existing structures, Sustainability 3.0 demands an “outside-in” approach: companies must align their identity and strategic core processes with pressing social and ecological challenges.

And still, many sustainability efforts only scratch the surface. Typical challenges include “cherry-picking”, which involves celebrating easily achievable sustainability goals while ignoring the fact that systemic changes have failed to materialize; rebound effects, in which efficiency increases lead to rising consumption; and carbon tunnel vision, a narrow focus on reducing CO₂ emissions as the sole solution to sustainability issues.

References

Toozé, Adam. 2022. “Welcome to the World of the Polycrisis.” *Financial Times*, October.