

Economic growth

What words come to mind when you read the word 'growth'? Perhaps: economy, progress, prosperity, Gross Domestic Product (GDP), improvement, well-being, wealth, jobs. In the news, we might read about the predicted effects of a crisis on the annual rate of GDP, right next to an article about the importance of meditation for personal growth. All in one word, 'growth' is identified with many things: social and political goals, the dynamics of the economy, individual or social achievement. It forms what the cognitive linguist George Lakoff calls a 'cognitive frame': in which a cluster of ideas is triggered by the mention of a single word.¹ As one example, 'regulation' might denote something positive for those on the left of the political spectrum, signifying the curbing of corporate greed and greater protections for the poor, while, on the right, it has negative connotations: more control by the state over people's personal lives, authoritarianism, socialism. '**Growth**', however, as a cognitive frame, is as yet less contested. In many corners of the political spectrum, it still signals improvement, development, more opportunities, more money, and so on. This cluster of interconnected ideas, where growth basically

¹ George Lakoff, 'Why It Matters How We Frame the Environment', *Environmental Communication* 4, no. 1 (2010): 70–81.

means 'more of the good stuff' or 'progress', is today almost ubiquitous and largely unchallenged.

Because it is both so ubiquitous *and* ambiguous, we need to be very clear and define what we mean by growth before we can even begin talking about degrowth. But this gets complicated when we consider that growth is often – almost purposefully, it seems – poorly defined by the people who advocate for it, even as it is obsessed over. And, given that it seems often simply to mean 'more good things', it is often hard to argue against.

In this book, we analyse growth as a core feature of capitalism. As we discuss in more detail in chapter 3, capitalism can be understood as society driven by accumulation. From this perspective, growth can be understood as the *materialization* of this dynamic of accumulation. To put it differently, capitalism appears as growth – and this materialization is not only *social*, but also *biophysical* or material. In this chapter, we argue that, to understand and dismantle the politics of growth today, we need to analyse economic growth as three interlinked processes that have evolved dynamically over time. First, growth is a relatively recent idea, the hegemony of which is the core ideology of capitalism, justifying the belief that growth is natural, necessary, and good, and that growth, as the increase of output and the development of productive forces, is linked to progress and emancipation. Second, growth is a *social process* that has long preceded the current hegemony of growth in contemporary society: a specific set of social relations resulting from and driving capitalist accumulation that stabilizes modern societies dynamically and at the same time makes them dependent on expansive dynamics of growth, intensification, and acceleration. Third, growth is a material process – the ever-expanding use of land, resources, and energy and the related build-up of physical stocks – which fundamentally transforms the planet and increasingly threatens to undermine the foundations of growth itself.²

² See Iris Borowy and Matthias Schmelzer, 'Introduction: The End of Economic Growth in Long-Term Perspective', in *History of the Future of Economic Growth: Historical Roots of Current Debates on Sustainable Degrowth*, ed. Iris Borowy and Matthias Schmelzer (London: Routledge, 2017), 1–26; Eric Pineault, 'The Growth Imperative of Capitalist Society', in *Degrowth in Movement(s)*:

Our central argument is that these three each have their own self-reinforcing dynamics, which are nevertheless interlinked, fundamentally shaping how we live. 'Economic growth' thus not only describes the increase and acceleration of the monetary production economy – that which is measured as GDP – but also a comprehensive material, social, and cultural process of mutually constitutive dynamics of expansion. This process of expansion has transformed life and the entire planet over the last five centuries. For a part of humanity, especially in the Global North, this has drastically improved material living conditions and enabled successful social struggles for participation. For others, this process was accompanied by exploitation and the destruction of livelihoods. Today, at the beginning of the twenty-first century, these intertwined dynamics of expansion are increasingly reaching their limits because they undermine the ecological, social, and political foundations on which they are based. We have been told that the rising tide of growth will lift all ships if we do not rock the boat (meaning if we do not disturb the progressive unfolding of the forces of growth and accumulation). However, in the face of the ecological crises of 'existential' proportions, the opposite seems more accurate: If we do not rock the boat of growth and pull the emergency lever, all lower decks will soon drown. If we do not switch tracks now, we will continue to be rocked by crisis after crisis until growth itself throws society from its own rails – violently. This leads us to the next chapter, where we outline the various critiques of growth upon which the degrowth literature has drawn.

2.1. Growth as an idea

One of the more basic, and important, ways to understand growth is as an ideological construction – a collective myth that shapes modern societies and how we are told to see the world and ourselves in it. While growth is also much more than this – as we explore further below

Exploring Pathways for Transformation, ed. Corinna Burkhart, Matthias Schmelzer, and Nina Treu (Winchester: Zer0, 2020), 29–43.

– many people do not realize that the concept of growth itself, applied to the economy, is a surprisingly recent invention. Even though there are various precursors – such as 'development', 'progress', or the much quoted 'wealth of nations' by Adam Smith – the term 'economic growth' has only been used since the middle of the twentieth century. It was not until the invention of GDP in the 1930s that growth in the modern sense **could be measured**, and it was not until the 1950s that it became the key ideology of capitalist and actually existing socialist societies. Since then, the idea that growth was desirable, necessary, and essentially infinite has become common sense: self-evident and far-reaching, fundamentally shaping the political, social, and economic developments on planet Earth.³ This increasingly global ideology, which plays a central role in the hegemonic stabilization of modern societies, is what we call the 'growth paradigm'.⁴ Yet, as we explore in the following sections, this is only one, and a relatively more recent, dimension of growth. In order to go beyond a simplistic critique of GDP, we must analyse how the modern growth paradigm builds on and is interlinked with growth as a social and material process, going back at least to colonization and early capitalism.

The invention of 'the economy'

An important prerequisite for economic growth becoming so central to state governance was the invention of 'the economy', as an independent sphere of social life based on specific laws which can be statistically recorded and measured. As early as the eighteenth and nineteenth centuries, political economists in England and France postulated economic development as a relatively autonomous sphere that balances itself through the famous 'invisible hand'. This process was considered

³ Here we won't get into debates on the differences between hegemony and ideology; see Terry Eagleton, *Ideology: An Introduction* (London: Verso, 1991); and Matthias Schmelzer, *The Hegemony of Growth: The OECD and the Making of the Economic Growth Paradigm* (Cambridge: Cambridge University Press, 2016).

⁴ Borowy and Schmelzer, *History of the Future of Economic Growth*; Schmelzer, *The Hegemony of Growth*; Gareth Dale, 'The Growth Paradigm: A Critique', *International Socialism* 134 (2012), isj.org.uk.

to be clearly separated from nature and politics and to be determined by its own laws. The separation between economic, political, and natural laws is at the basis of liberalism, a doctrine advancing minimal state intervention into the autonomous sphere of economic activities.⁵ But it was not until the 1930s and 1940s that economic experts, politicians, and, increasingly, the public began to understand 'the economy' as a self-contained totality where flows of money regulate the relationships between the production, distribution, and consumption of goods and services within nationally organized borders.⁶ This idea, which today is widely taken for granted, replaced the older view in which economic processes were conceptualized as physical material and energy flows, which naturally gave rise to limits to growth. In contrast, the new measures, which aimed at 'the speed and frequency with which paper money changed hands', seemed to be able to expand without limit, without being limited by physical or territorial boundaries.⁷

The development of accounting techniques and statistical tools, in particular national accounts and GDP, was central to this understanding of 'the economy'. The latter was developed in the 1930s and 1940s in conjunction with Keynesian efforts to combat the Great Depression and as a tool for planning war economies and arms production in the United States and England during the Second World War. In GDP, the formerly fuzzy sphere of 'the economy' was crystallized into a technical object with clearly defined contents and boundaries. Put simply, GDP measures the sum of the monetary value of goods and services, produced by paid labour, sold in a given period of time (e.g., one year) in a given economic area (e.g., Greece, or the world). Often, GDP is divided by the number of inhabitants of a country or region and then expressed as per capita GDP. Over time, this became a much-used

⁵ Philip Mirowski, *More Heat Than Light: Economics as Social Physics, Physics as Nature's Economics* (Cambridge: Cambridge University Press, 1989); Wendy Brown, *Undoing the Demos: Neoliberalism's Stealth Revolution* (Boston: MIT Press, 2015).

⁶ Timothy Mitchell, 'Economicity: How the Future Entered Government', *Critical Inquiry* 40, no. 4 (2014): 479–507.

⁷ *Ibid.*; Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (London: Verso, 2011); Schmelzer, *The Hegemony of Growth*.

measure of prosperity – and used especially as a metric to compare different countries or different time periods.⁸

As we discuss in more detail in the third chapter, GDP has been criticized from different perspectives. In essence, the criticism is that GDP only measures the *monetary value* of goods and services produced through *gainful employment*: it does not distinguish between the *positive and negative effects* of these products and services on the well-being of a society and makes everything that is not paid for invisible. In addition, GDP measurements fail to take into account *who gets paid for which work*, and how this is *distributed* within a society. This means that unpaid activities such as housework and care, self-sufficiency and subsistence, or voluntary work, as well as stewardship of the land, are not included. An increase in car accidents, for example, can therefore increase GDP through medical treatment, car repairs, and so on – and so can environmental destruction, if it leads to more paid work. The growing production of wasteful packaging, discarded electronics, and damaged and non-repairable equipment, or the monetarization of entire areas of society that were previously not regulated by money, such as ride-sharing, all contribute to economic growth.⁹

Far less well known is the fact that all these controversies about the correct measurement of wealth and the economy can be traced back to the period of development and international standardization of GDP in the late 1940s and early 1950s. Almost all leading economists in the middle of the twentieth century, including the ones who invented GDP, spoke out against using it as a yard-stick for the prosperity of nations

⁸ Diane Coyle, *GDP: A Brief but Affectionate History* (Princeton, NJ: Princeton University Press, 2014); Lorenzo Fioramonti, *Gross Domestic Problem: The Politics behind the World's Most Powerful Number* (London: Zed Books, 2013); Philipp Lepenies, *The Power of a Single Number: A Political History of GDP* (New York: Columbia University Press, 2016); Dirk Philippsen, *The Little Big Number: How GDP Came to Rule the World and What to Do about It* (Princeton, NJ: Princeton University Press, 2015); Schmelzer, *The Hegemony of Growth*.

⁹ Stephen J. Macekura, *Mismeasure of Progress: Economic Growth and Its Critics* (Chicago: University of Chicago Pr., 2020); David Pilling, *The Growth Delusion: Wealth, Poverty, and the Well-Being of Nations* (New York: Crown, 2018); Marilyn Waring, *Counting for Nothing: What Men Value and What Women Are Worth* (Toronto: University of Toronto Press, 1999).

and for international or historical comparisons.¹⁰ There were a number of conceptual differences between national traditions for measuring GDP and fundamental disagreements about the measurement method. Debates revolved around concepts such as externalities, unpaid housework, and subsistence. Accordingly, different countries defined income in different ways. Some, for example, did count unpaid housework or, in addition to monetary values, accounted for material flows such as processed steel in kilograms. But governments and international organizations (especially the OECD and the UN) streamlined these intense academic debates, as they urgently needed comparative statistics to manage membership dues and international aid payments, and unified existing approaches by standardizing a particular version of GDP measurement in the early 1950s.¹¹ Since then, this statistical measuring method established itself in the capitalist West and then globally, making GDP the 'world's most powerful number'.¹² Although the statistical measurement method has been constantly updated and adapted within the framework of the UN – primarily to deal with changes in the importance of trade and technological innovations – the core logic of '(mis-) measuring our lives' through GDP has remained the same to this day.¹³

This modern, *dematerialized* understanding of 'the economy' made invisible how present-day economies fundamentally depend on an ever-increasing flow of energy and matter. Its implementation is closely linked to technical and geopolitical shifts in the twentieth century, which led to the explosion of the global energy supply and the total materials and land used in subsequent decades.¹⁴

¹⁰ Schmelzer, *The Hegemony of Growth*; Fioramonti, *Gross Domestic Problem*; Coyle, *GDP*.

¹¹ Schmelzer, *The Hegemony of Growth*.

¹² Fioramonti, *Gross Domestic Problem*.

¹³ Joseph Stiglitz, Amartya Sen, and Jean-Paul Fitoussi, *Mismeasuring Our Lives: Why GDP Doesn't Add Up* (New York: New Press, 2010). See also Philippsen, *The Little Big Number*, and Fioramonti, *Gross Domestic Problem*.

¹⁴ Will Steffen et al., 'Trajectories of the Earth System in the Anthropocene', *Proceedings of the National Academy of Sciences* 115, no. 33 (2018): 8252–9; Mitchell, *Carbon Democracy*; Fridolin Krausmann et al., 'Growth in Global Materials Use, GDP and Population during the 20th Century', *Ecological Economics* 68, no. 10 (August 2009): 2696–705.

Bear in mind that GDP is far more than a technical tool for measuring economic activity. It generates a whole grammar that not only shapes economics but also structures shared ideas of the world – above all, through its close connection to the growth paradigm. So, while economic growth is a highly ambivalent and elusive concept, its semantic core is statistically fixed: it is defined as the annual increase in GDP or per capita GDP and is usually expressed in percentages.

The growth paradigm

The international standardization of statistical measurements of the economy was central to making growth a policy objective. Only through this universalized concept of 'the economy', commensurable over time and space, did it become conceivable to measure what was to grow: the sum of market transactions within national borders. Only then did the idea that long-term, stable, and unlimited growth was at all possible and desirable become established.

In fact, in the political discussions of the early post-war period, the idea of economic growth was conspicuously absent. Rather, the central themes were full employment, stability, and reconstruction. Before 1950, there was almost no interest at all in economic growth as a policy goal in political statements or economic literature.¹⁵ In the following years, however, growth was catapulted to the top of the hierarchy of political goals. At the time, movements for decolonization were arising in former colonies around the world, the Cold War was in full swing, and it became imperative to pacify class struggles in both the Global North and South. Something needed to be done to stabilize Western economic dominance and capitalist class relations. There needed to be a way to show conclusively the progress of capitalist economies. First declared the goal of national economic policy by the chairman of the US Council of Economic Advisers in 1949, it became the globally accepted measure of progress from the mid-1950s onwards. The sociological modernization theories developed by North American and

¹⁵ Dale, 'The Growth Paradigm'; Mitchell, 'Economicity'; Schmelzer, *The Hegemony of Growth*.

European white men were framed as an irreversible and unilinear process of economic growth.¹⁶ Cold War competition further fuelled the race for growth, through which governments could show their economic dominance. Growth became the yard-stick for comparing the productivity of capitalist and socialist economies. Emblematic of this crucial phase of the development of the growth paradigm is a 1958 statement by Nikita Khrushchev, chairman of the Council of Ministers of the Soviet Union: 'Growth of industrial and agricultural production is the battering ram with which we will smash the capitalist system.'¹⁷ Nation-states thus entered into competition not for equality, emancipation, or jobs, but for the rising quantity of goods and services they could produce. By the late 1950s, growth had become a central goal of economic policy and the most important indicator, tying growth and welfare together and equating them with the continuous expansion of market transactions. In this constellation, GDP became the first and general indicator of the modernity, prosperity, standard of living, development, and prestige of countries.

The hegemony of growth fundamentally transformed the state's tasks, purpose, and legitimacy, all of which became linked to growth and thus to the economy. This process occurred much earlier than is usually believed. Wendy Brown, for example, situates the threefold economization of the state in the 1980s and links it to the rise of neoliberalism:

The state secures, advances, and props the economy; the state's purpose is to facilitate the economy, and the state's legitimacy is linked to the growth of the economy – as an overt actor on behalf of the economy. State action, state purpose, and state legitimacy: each is economized by neoliberalism.

¹⁶ Arturo Escobar, *Encountering Development: The Making and Unmaking of the Third World* (Princeton, NJ: Princeton University Press, 1995); Ariel Salleh, *Ecofeminism as Politics: Nature, Marx and the Postmodern* (London: Zed Books, 2017).

¹⁷ Cited in Schmelzer, *The Hegemony of Growth*, 163; see also Dale, 'The Growth Paradigm'.

A focus on the rise of the growth paradigm, however, shows that already from the 1950s onwards the expansion of the economy became what could be described as the *raison d'état*.¹⁸ Government interventions all over the world became largely focused on maintaining a stable growth path and on creating and maintaining favourable investment conditions. The growth state stood at the centre of the democratic-capitalist constellation of the 'golden age', the long phase of stability and rising prosperity in the second half of the twentieth century.

The growth paradigm has played a key role in transforming the social discourse on how to distribute wealth: from a zero-sum game in which a fixed amount is distributed (so what some win, others lose), to a seemingly positive-sum game in which everyone benefits from the growing economic product and therefore has a common interest in economic growth.¹⁹ Growth promised to turn difficult political conflicts over distribution into technical, non-political management questions of how to collectively increase GDP – an ideology that only partially reflected reality within the capitalist core during the 'golden age', and much less so from a global socio-metabolic perspective.²⁰

By thus transforming class and other social antagonisms into so-called win-win situations, it provided what could be called an 'imaginary resolution of real contradictions' and played a key role in producing the stable post-war consensus around embedded liberalism.²¹ In the West, growth made it possible to redirect the demands of the workers' movement towards more participation and equality. In the East, it justified the lack of democracy and the failure of revolutionary ambitions. In the 'developing countries' – a category itself developed through the logic of the growth paradigm – it served in combination

¹⁸ Brown, *Undoing the Demos*, 64; Schmelzer, *The Hegemony of Growth*.

¹⁹ Dale, 'The Growth Paradigm'.

²⁰ Eric Pinault has proposed analysing the 'material trajectory of advanced capitalism as a zero-sum game' during this period. See Eric Pineault, 'The Ghosts of Progress: Contradictory Materialities of the Capitalist Golden Age', *Anthropological Theory* 21, no. 3 (2021): 260–86, 260.

²¹ Eagleton, *Ideology*; Schmelzer, *The Hegemony of Growth*; Charles S. Maier, 'The Politics of Productivity: Foundations of American International Economic Policy after World War II', *International Organization* 31, no. 4 (1977): 607–33.

with the idea of 'development' as justification for the smashing of subsistence and traditional economies and the implementation of large-scale technical infrastructures after the formal end of colonialism, and further as a way to justify structural adjustment and the stripping of public goods.²² Growth thus helped to overcome the political focus on equality and redistribution, depoliticizing the economy. As noted by an American economist and advisor to President Eisenhower: 'Growth is a substitute for equality of income. As long as there is growth there is hope, and that makes large income differentials tolerable.'²³

In fact, growth became presented as the common good, thus justifying the particular interests of those who benefitted most from the expansion of market transactions and capital accumulation as beneficial for all. The historian Charles S. Maier puts it in a nutshell: 'The true dialectic was not one of class against class, but waste versus abundance.'²⁴ Drawing on the definition of hegemony, as developed by the Italian Marxist Antonio Gramsci, growth appears as an unquestionable, positive value at the centre of a network of ideas and everyday common sense which justifies, and silently coerces people into, contemporary relations of power and hierarchy – including social relations of production such as wage work.²⁵ As discussed in more detail below, by tightly linking ideas of emancipation and progress to economic growth, the growth paradigm became the normative ideal of modernity – not just in liberal circles, but also in socialist thought. Indeed, the power of this

22 Schmelzer, *The Hegemony of Growth*; Escobar, *Encountering Development*; Wolfgang Sachs, *The Development Reader: A Guide to Knowledge and Power* (London: Zed Books, 1992); Giorgos Kallis, *Degrowth* (Newcastle upon Tyne: Agenda Publishing, 2018).

23 Henry C. Wallich, 'Zero Growth', *Newsweek*, 24 January 1972, 62.

24 Cited in Schmelzer, *The Hegemony of Growth*, 117.

25 The hegemony of growth is thus a comprehensive social practice that not only accepts growth as a necessary prerequisite for improving the living conditions of wage earners, but also sanctions dominant forms of ownership and rule. As we will explore in the third chapter, these power relations include class, race, gender, and South–North uneven development. Antonio Gramsci, *Prison Notebooks*, ed. by Joseph A. Buttigieg, vols. 1–3 (New York: Columbia University Press, 2011). See also Giacomo D'Alisa and Giorgos Kallis, 'Degrowth and the State', *Ecological Economics* 169 (2020): 106486; Schmelzer, *The Hegemony of Growth*.

myth became so strong that it captured most intellectual currents and social movements on the progressive left that wanted to overcome capitalism – which, as put by Eric Pineault, 'have remained imprisoned in the imaginary of growth.'²⁶

2.2. Growth as a social process

We can now understand growth as a hegemonic idea that emerged quite recently, discursively tied to GDP. But growth is far more than an increase in GDP, as it is normally defined. In fact, GDP is only the tip of the iceberg, the surface phenomenon of a whole set of social processes related to capitalist accumulation that drive growth, and of ever-increasing biophysical flows that are mobilized by this global economy. To see the whole picture of this world system, we must go much further back than the twentieth century, because this newer ideology of growth is itself rooted in both *social* and *biophysical* processes that go back to the beginnings of capitalism and colonialist expansion. This deeper understanding of the nature of growth distinguishes degrowth from more vague critiques of economic growth, which focus on the pitfalls of GDP alone and are limited to proposing alternative ways of measuring economic output, rather than addressing the roots of growth itself. In the following sections we analyse growth as a social process: a specific set of social relations resulting from capitalist accumulation, which not only drive the reproduction of capitalism but also act as a central stabilizing mechanism in modern society. To understand this aspect of growth, we need to engage with the humanities, social sciences, and political economy. In this section, we begin by discussing how capitalism emerged and analyse how growth led to specific class structures which, in turn, brought about a dynamic relationship between class formations and material growth. We argue that 'dynamic stabilization' is a core feature of modern

26 Pineault, 'The Growth Imperative of Capitalist Society', 32. See also Schmelzer, *The Hegemony of Growth*; Giorgos Kallis, 'Socialism without Growth', *Capitalism Nature Socialism* 30, 2 (2019): 189–206.

societies – where, in order to remain stable and reproduce their social structures, growth societies require continuous economic expansion, technological innovation and escalation, and social-cultural acceleration. Dynamic stabilization explains how and why growth societies are fundamentally dependent on growth.

Unleashing capital: the dynamics of accumulation

The social materialization of capitalist accumulation can be analysed as an economy driven by the production of profit – in which societal wealth ‘presents itself as an immense accumulation of commodities.’²⁷ The annual production of these commodities is, more or less, what GDP measures. Within capitalism, money moves through society and mobilizes machines, resources, and labour power to produce commodities. As will be discussed in more detail in chapter 3, the expansion of the output of this commodified societal wealth rests on capital being invested (the ‘input’) to increase the capacity to produce and circulate commodities (the ‘output’).

Many analyses and critiques of capitalism deal with the structural relations, tensions, and contradictions resulting from the dynamics between these factors, mainly capital and labour, and focus on the period when the monetary production economy became dominant with industrialization. However, the analysis of capitalism that has shaped the degrowth debate not only starts much earlier, with the rise of capitalist enterprises in the context of colonialism. It also centres of capitalist growth, mainly related to the commodification and appropriation of nature and care, processes of devaluation, cheapening and externalization, and to the dynamic stabilization of capitalist society through growth. While this analysis will further unfold throughout the rest of the book, the following sections

²⁷ Karl Marx, *Capital: A Critique of Political Economy, Volume 1*, trans. Ben Fowkes (New York: Vintage, 1976), 27; Ulrich Brand et al., ‘From Planetary to Societal Boundaries: An Argument for Collectively Defined Self-limitation’, *Sustainability: Science, Practice and Policy* 17, no. 1 (2021): 265–92; Augusto Graziani, *The Monetary Theory of Production* (Cambridge: Cambridge University Press, 2003).

sketch some historical background that might help illustrate this perspective.²⁸

Homo sapiens have lived on this planet for about 200,000 years. For most of human history, all humans have lived nomadically as hunters and gatherers. Agriculture existed for about 10,000 years as a regionally dominant production method, and since then phases of social development have alternated with phases of decay in various regions of the world. However, there was no, or close to no, economic growth in its modern sense. This only started to change with the beginning of colonialism, the rise of capitalist enterprise, and then industrialization.²⁹ For most of human history, communities’ relationships and self-reproduction were based on systems of mutual obligations, power, or wealth, but not on the logic of capitalism, the ceaseless accumulation of capital. Over thousands of years, humans have experimented with a vast array of social formations, some of which included large and complex civilizations organized on surprisingly egalitarian lines, others involving merchants investing in the expansion of trade – yet on the whole, those dealing with capital remained marginal to those societies. This started to change beginning with the emergence of the ‘world system’ in the sixteenth century.³⁰

²⁸ Jason Hickel, *Less Is More: How Degrowth Will Save the World* (London: William Heinemann, 2020); Pineault, ‘The Growth Imperative of Capitalist Society’; Utsa Patnaik and Prabhat Patnaik, *Capital and Imperialism: Theory, History, and the Present* (New York: NYU Press, 2021).

²⁹ Of course, all the problems of GDP accounting discussed in this book multiply when economists try to reconstruct long-term growth trends going back hundreds of years to economies where most work was done outside of markets and wage relations. But – as far as this can be measured retrospectively at all – preindustrial growth of GDP was very slow, with annual per capita rates measured in fractions of a per cent. See Vaclav Smil, *Growth: From Microorganisms to Megacities* (Boston: MIT Press, 2019), chapter 5; Jürgen Osterhammel, *The Transformation of the World: A Global History of the Nineteenth Century* (Princeton, NJ: Princeton University Press, 2014); Desmond C. M. Platt, *Mickey Mouse Numbers in World History: The Short View* (Basingstoke: Macmillan, 1989).

³⁰ David Graeber and David Wengrow, *The Dawn of Everything: A New History of Humanity* (New York: Farrar, Straus and Giroux, 2021); Sven Beckert, *Empire of Cotton: A Global History* (New York: Alfred A. Knopf, 2014); Immanuel

At that time, early venture capital companies, driven by the arms race of the early modern European states and their enormous capital requirements, financed expansionary voyages to the Americas, importing raw materials such as cotton and silver. From these early colonial enterprises, trading companies emerged, which later developed into joint-stock companies whose central purpose was, and remains, the endless accumulation of capital. Increasingly, capitalists started to invest in agriculture and industry, thus permeating the world of human labour with the logic of continuous accumulation and – where they could, as with the plantation regime around cotton – remaking the entire mode of production to their benefit. By appropriating raw materials, based on both slave and wage labour, and by integrating these through trade flows that spanned from Europe to the Americas, they created a dynamic world system that has since reshaped the entire planet.³¹

This accumulation took place at the expense of people in different parts of the world in different ways. In the Americas, genocides were perpetrated against Indigenous peoples, and millions of people from African regions were sold into slavery. The entire colonial enterprise, so intricately linked to the emergence of capitalism, was justified by racism – the systematic dehumanization of certain groups of people for the benefit of others – which came to form an integral part of the social dynamics of capitalism to this day. Through the privatization of the commons, the rural population in Europe lost the basis for their subsistence production. These enclosures also created the everyday scarcity that is still the basis of capitalist growth today – limiting people's ability to use their surroundings for subsistence and generation of communal wealth. Stripped of the land and their means of subsistence production, people were forced into wage labour – a process of violent 'primitive

Wallerstein, *World-Systems Analysis: An Introduction* (Durham, NC: Duke University Press, 2004).

³¹ Ibid.; Amitav Ghosh, *The Nutmeg's Curse: Parables for a Planet in Crisis* (Chicago: University of Chicago Press, 2021); Jason W. Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital* (London: Verso, 2015); Fabian Scheidler, *The End of the Megamachine: A Brief History of a Failing Civilization* (Winchester: Zer0, 2020).

accumulation' (Karl Marx) or incorporation of non-capitalist social worlds (Rosa Luxemburg) that continues in ever-changing forms to this day. States played a key role in all of this – not only in the 'war capitalism' of the earlier period, but also by driving land seizure around the world and by using their powers in the 'cheapening' of key resources, in imperial wars underlying capitalist development, or in guaranteeing the property rights that made capitalist production possible in the first place.³² As we discuss at length in the next section, the entire dynamism within the world system changed when, beginning in the eighteenth century, the plantation revolution in the Americas was linked with emerging industrial capitalism in Europe, which in turn started to be increasingly powered by a truly revolutionary technology: coal-fired steam engines.³³

These social and economic changes went hand in hand with the emergence of a set of perspectives and ideas that legitimized, enabled, and even drove the expansion of the world system – and which also laid the foundation for the later development of the modern growth paradigm. To begin with, the idea of the 'development' or 'progress' of human societies in a linear course of time had to be actively produced. Most known cultures of the past – as well as some contemporary communities – had a cyclical understanding of time as 'eternal recurrence', interpreted their present as an abandonment from a mythical ideal past to be restored, or had some other non-linear conception of time. Yet beginning with the Renaissance and building on Christian apocalypticism, which assumed an absolute end point of human societies with the Last

³² Marx, *Capital*, Volume 1, 873; Rosa Luxemburg, *The Accumulation of Capital* (London, New York: Routledge, 2003 [1913]); Silvia Federici, *Caliban and the Witch: Women, the Body and Primitive Accumulation* (New York: Autonomedia, 2004); Patnaik and Patnaik, *Capital and Imperialism*; Karl Polanyi, *The Great Transformation* (Boston: Beacon Press, 1944); Moore, *Capitalism in the Web of Life*; Cedric J. Robinson, *Black Marxism: The Making of the Black Radical Tradition* (Chapel Hill: University of North Carolina Press, 2005); Hartmut Rosa, Stephan Lessenich, and Klaus Dörre, *Sociology, Capitalism, Critique* (London: Verso, 2015).

³³ Andreas Malm, *Fossil Capital: The Rise of Steam Power and the Roots of Global Warming* (London: Verso, 2016); Beckert, *Empire of Cotton*; Kenneth Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton, NJ: Princeton University Press, 2000).

Judgment, concepts of abstract time and space emerged in Europe, in particular since the seventeenth century. The spread of the mechanical clock promoted changes in the understanding of time as objective, linear, and countable. Geometry and cartography also enabled a new conceptualization of land and territory as abstract, borderless, uniform, and measurable space that can be emptied or filled as needed, clearly demarcated, and traded as a commodity through property rights.³⁴ Early modern natural sciences not only promoted the idea of abstract nature but also argued that humans could dominate nature. In a mechanistic view of the world, nature and human labour were conceived of as mechanisms governed by laws and flows of energy that could correspondingly be manipulated and controlled (see section 3.6).³⁵

Concepts and practices of linear time, abstract space, and mechanical nature became key ideological building blocks of the capitalist colonization of the planet. The practical treatment of all things and living beings as comparable, interchangeable, and tradable, as well as the mechanistic understanding of nature based on linear thinking, were consolidated in colonialism. The plundering of the planet was thus justified by the idea that land, natural resources, the work of women and the colonized, and all life are to serve mankind (and this was usually meant only the white men who claimed ownership of it³⁶) and can therefore be possessed, exploited, and changed at will (see sections 3.1 and 3.5).³⁷ Beginning with the seventeenth century, these ideas

³⁴ Scheidler, *The End of the Megamachine*; Dale, 'The Growth Paradigm'; Malm, *Fossil Capital*; Carolyn Merchant, *The Death of Nature: Women, Ecology, and Scientific Revolution* (San Francisco: Harper and Row, 1980).

³⁵ Merchant, *The Death of Nature*; Joachim Radkau, *Nature and Power: A Global History of the Environment* (Cambridge: Cambridge University Press, 2008); George Caffentzis, *In Letters of Blood and Fire: Work, Machines, and the Crisis of Capitalism* (Oakland: PM Press, 2012).

³⁶ White is not a biological property, but rather the privileged position within the dominant structures of racism. Alan H. Goodman, Yolanda T. Moses, and Joseph L. Jones, *Race: Are We So Different?* (Hoboken, NJ: John Wiley & Sons, 2019); Cedric J. Robinson, *On Racial Capitalism, Black Internationalism, and Cultures of Resistance* (London: Pluto Press, 2019).

³⁷ Ghosh, *The Nutmeg's Curse*; Richard H. Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600–1860*

underwent a secularized reformulation: a linear narrative of progress divided people into 'civilized' and 'primitive' based on racist metrics, thus legitimizing colonial expansions. At the height of imperialism and in early 'development' discourse, poor countries were seen to be in need of outside intervention by European or American experts, to speed up their 'development' on a linear path of social and economic improvement. In the twentieth century, the linear narrative was economized, as general social progress was increasingly conflated with the expansion of production.³⁸ Under capitalism, growth became the secular promise of redemption.

The mechanistic understanding of nature also laid the foundation for eighteenth-century European economists' understanding of 'the economy' as a separate area of social life that is measurable and predictable like clockwork – and which corresponded to changes in the world of work.³⁹ This sector of the formal economy was characterized throughout the nineteenth century by the spread of gainful employment as a male-dominated sector separate from the rest of life. At the same time, unpaid reproductive work became 'housewifely' – devalued, but necessary for the reproduction of labour power. Thus the invisibility and appropriation of unpaid reproductive work associated with wage labour still characterizes gender relations and the world of work today (see section 3.6).⁴⁰ Different disciplinary technologies, manifested in institutions such as factories, the military, prisons, and

(Cambridge: Cambridge University Press, 2010); Naomi Klein, *This Changes Everything: Capitalism vs. the Climate* (London: Penguin UK, 2014).

³⁸ Escobar, *Encountering Development*; Walter Mignolo and Catherine E. Walsh, *On Decoloniality: Concepts, Analytics, Praxis* (Durham, NC: Duke University Press, 2018); Gilbert Rist, *The History of Development: From Western Origins to Global Faith* (London: Zed Books, 1996); Schmelzer, *The Hegemony of Growth*.

³⁹ Dale, 'The Growth Paradigm'. For more historical literature, see Giorgos Kallis et al., 'Research on Degrowth', *Annual Review of Environment and Resources* 43 (2018): 291–316.

⁴⁰ Veronika Bennholdt-Thomsen and Maria Mies, *The Subsistence Perspective: Beyond the Globalized Economy* (London: Zed Books, 1999); Maria Mies and Vandana Shiva, *Ecofeminism* (London: Zed Books, 1993); Moore, *Capitalism in the Web of Life*; Salleh, *Ecofeminism as Politics*.

schools, promoted the proletarianization of labour. This change in work led to the monetarization of more and more spheres of life and was accompanied by the suppression of relationships of reciprocity.⁴¹ This proletarianization of previously subsistence-based communities, rooted in the system of wage labour, created a lock-in effect, where workers, too, depend on growth to satisfy their most basic needs as they are no longer able to survive outside of the capitalist system.⁴²

The social implementation of abstract concepts of time and space, a process that took centuries to reach the entire globe, symptomatically stands for the abstract logic of capitalist modernity: the practice of the – scientific, and above all economic – production of equivalences between completely different concrete realities. The fact that labour, land, and many other things were made measurable and comparable, largely by means of an abstract standard of comparison expressed in money, created the conditions for exchanging everything for everything else.⁴³ Growth, in this sense, is also a process of the relentless and often violent commodification and repeated colonization of natures, life worlds, and reproductive activities, all of which became increasingly shaped by market-mediated social relations – a process that is still ongoing.⁴⁴

Growth as dynamic stabilization

Modern societies dynamically stabilize through a continuous process of expansion and intensification in terms of space, time, and

41 David Graeber, *Bullshit Jobs: A Theory* (New York: Simon & Schuster, 2018); Osterhammel, *The Transformation of the World*.

42 Pineault, 'The Growth Imperative of Capitalist Society'; Adelheid Biesecker and Sabine Hofmeister, 'Focus: (Re)productivity: Sustainable Relations Both between Society and Nature and between the Genders', *Ecological Economics* 69 (2010): 1703–11.

43 Max Horkheimer and Theodor W. Adorno, *Dialectic of Enlightenment* (London: Verso, 1996).

44 Raj Patel and Jason W. Moore, *A History of the World in Seven Cheap Things: A Guide to Capitalism, Nature, and the Future of the Planet* (Berkeley: University of California Press, 2017); Hickel, *Less Is More*.

energy.⁴⁵ This means that modern societies inherently rely on growth to stabilize their institutions. These dynamics, while being based on processes of appropriation and exploitation as analysed above, did provide material prosperity to more and more people. While initially largely reserved to *white* men in the middle and upper classes in Europe, these sustained dynamics of growth also enabled successful social and political struggles that made this material standard of living accessible to an increasingly larger part of humanity, especially in the Global North, but also in the middle and upper classes of the Global South. This increasing democratization of material prosperity – from consumer goods such as sugar and tea for European workers in the nineteenth century to larger private homes, household appliances, cars, and travel in the twentieth century – again laid the foundation for the continued acceleration of economic growth. And – as a stabilizing mechanism for capitalism – the promise of rising levels of material prosperity through economic growth served to pacify social conflicts and to create consent for the technocratic, productivist politics of growth societies.⁴⁶ This does not only apply to the capitalist core countries. Even the real existing socialist societies of the twentieth century were – albeit under different circumstances – fundamentally productivist growth societies. Under the pressure of competition between the Western and Eastern blocs, they also relied on increasing economic output and growing material prosperity in order to guarantee their social stability.⁴⁷ And, as we will explore throughout the book, the promise of a better life through growth also

45 Rosa, Lessenich, and Dörre, *Sociology, Capitalism, Critique*; Radkau, *Nature and Power*; Moore, *Capitalism in the Web of Life*; Hartmut Rosa, *Resonance: A Sociology of Our Relationship to the World* (Cambridge: Polity Press, 2019).

46 Frank Trentmann, *Empire of Things: How We Became a World of Consumers, from the Fifteenth Century to the Twenty-First* (New York: Harper Perennial, 2017); Schmelzer, *Hegemony of Growth*; Kallis, *Degrowth*; Tim Jackson, *Prosperity without Growth: Economics for a Finite Planet* (London: Earthscan, 2016).

47 Radkau, *Nature and Power*; Wallerstein, *World-Systems Analysis*; Ekaterina Chertkovskaya and Alexander Paulsson, 'The Growthocene: Thinking Through What Degrowth Is Criticising', *Entitle Blog*, 19 February 2016, entitleblogdotorg3.wordpress.com.

legitimized and thus stabilized uneven development globally – the promise of future growth made inequalities seem acceptable.

Furthermore, dynamic stabilization goes beyond material prosperity. In fact, many of the social and political achievements people in modern welfare states have access to today, such as the right to vote, a minimum wage, health care, and a five-day workweek, were fought for by strong social movements and trade unions in the context of expansive and fossil fuel-driven modernity. The power of the strike in the twentieth century, for example, was closely linked to the need for the labour force to operate the facilities necessary for the mining, transport, and processing of coal and, consequently, their ability to effectively paralyse them. To highlight the intimate entanglements between the material properties of coal, which enabled coal workers to become the spearhead of a strong workers movement that successfully fought for welfare and participation, and the resulting mass democracy, the historian Timothy Mitchell has termed modern representative systems 'carbon democracies'.⁴⁸ The historian Dipesh Chakrabarty makes a similar argument: emancipation movements went hand in hand with the dynamics of fossil fuel-powered growth and were based on it: 'The mansion of modern freedoms stands on an ever-expanding base of fossil fuel use. Most of our freedoms so far have been energy-intensive.'⁴⁹ And similar arguments can be made regarding other modern achievements. Indeed, the public institutions of modern societies – including the welfare state itself, which sought to pacify and constrain capitalism and which emerged from the great emancipatory struggles of the nineteenth and twentieth centuries – stabilize themselves through economic growth: they emerged within, contributed to, and are structurally dependent on expanding economies.⁵⁰ This includes institutions such as pension systems, health insurance, unemployment benefits, long-term care insurance, public education systems, universities, and public infrastructures (roads and railways, water and sewage pipelines,

48 Mitchell, *Carbon Democracy*.

49 Dipesh Chakrabarty, 'The Climate of History: Four Theses', *Critical Inquiry* 35, no. 2 (2009): 208.

50 Rosa, Lessenich, and Dörre, *Sociology, Capitalism, Critique*.

electricity and telecommunications networks). Increasing production created surpluses and thus facilitated struggles for the distribution of wealth, the shortening of working hours, and social security systems.⁵¹ As also argued by Thomas Piketty, the structural tendency within capitalism to increase inequality could historically be counteracted in phases of high growth.⁵² It must be noted, however, that these achievements, rights, and freedoms were not the direct outcome of capitalist growth, but rather resulted from struggles from below. As the economic historian Stefania Barca points out, 'health, wealth, longevity and security are not the result of global trade and capital, but of those forces which have opposed them.'⁵³ Nonetheless, these struggles did occur within the context of economic growth and were fundamentally shaped by it – and this has important implications for a future beyond growth.

In the nineteenth and twentieth centuries, the economic and social model of an expansive modernity, characterized by growth, was thus not only very successful in material terms but also enabled rising and hitherto-unknown levels of social, political, and cultural achievements and rights, mostly within the early industrialized capitalist centres, but in parts also in emerging countries and globally. The fact that key democratic, social, and cultural rights were thus fought for in the context of expansive modernity, and that within the growth paradigm societal progress became conflated with GDP growth, has laid the foundation for a powerful common sense, based on lived experience, that social improvements do indeed require economic growth and the development of the productive forces. This applies in particular to the Fordist regime, which prevailed mainly in industrialized countries from the 1920s to the 1970s. Fordism was a social constellation of production methods and

51 See, for example, Bernd Sommer and Harald Welzer, *Transformationsdesign: Wege in eine zukunftsfähige Moderne* (München: Oekom, 2014); Rosa, Lessenich, and Dörre, *Sociology, Capitalism, Critique*; Imre Szeman and Dominic Boyer, eds., *Energy Humanities: An Anthology* (Baltimore: Johns Hopkins University Press, 2017).

52 Thomas Piketty, *Capital in the Twenty-First Century* (Cambridge, MA: Harvard University Press, 2014).

53 Stefania Barca, *Forces of Reproduction: Notes for a Counter-hegemonic Anthropocene* (Cambridge: Cambridge University Press, 2020), 17.

power relations based on standardized factory labour (largely male bread-winners), rising productivity (based on fossil fuels and standardization), and rising wages (enabling increasing mass-consumer markets to absorb the rising output), which temporarily pacified the conflict between capital and labour mainly in industrialized countries. The very high growth rates of this period helped to create consumer societies built around a work-and-spend ethics and ample markets to increase production, which was key for capital to expand – as put by Henry Ford himself: ‘Cars don’t buy cars’. At the same time, high growth rates did translate to a certain democratization of prosperity – it was the period in which Western lifestyles of building houses in suburbs, driving cars, and owning washing machines became dominant.⁵⁴ Today, even after decades of neoliberal welfare cuts and austerity, social memory of this era still powerfully links hopes of social improvement to growth.

This experience of the democratization of prosperity, which was powerfully associated with growth, became the formative experience of entire generations in industrialized countries. Recently, the term ‘imperial mode of living’ was introduced to describe how this way of life, which has great capacity to stabilize capitalist centres, requires an uneven, imperial global structure that ensures global access to cheap resources, energy, and labour, while at the same time externalizing its ecological costs to Global South regions and the future. Driven by the global spread of its media representation, the imperial mode of living, with all its fossil fuel-based comforts and capitalist consumer goods, also became a global dream for many, even in the peripheral regions, who had thus far laboured to provide the foundations of this prosperity but were excluded from its benefits (see section 3.7).⁵⁵ It is this experience of Fordist democratization of prosperity and its attachment to consumer lifestyles which the critique of growth today has to work its way through, at least in the early-industrializing countries. In fact, the legitimating narrative of the progressive nature of growth and the

⁵⁴ Eric Pineault, ‘From Provocation to Challenge: Degrowth, Capitalism and the Prospect of “Socialism without Growth”’, A Commentary on Giorgios Kallis’, *Capitalism Nature Socialism* 30, no. 2 (2018): 1–16.

⁵⁵ Ulrich Brand and Markus Wissen, *The Imperial Mode of Living: Everyday Life and the Ecological Crisis of Capitalism* (London: Verso, 2021).

development of productive forces is so powerful that it also shapes the outlook of parts of the left. And the function of growth as a stabilizing mechanism remains one of its key justifications.

However, this common sense is increasingly eroding: contemporary growth since the 1970s is showing **diminishing social returns**. In the capitalist core, ever higher economic output has failed to translate into a proportionate increase in well-being; this growth has not led to more equality (except in parts of Asia), because the fruits of growth have largely been captured by a small global elite; and, most importantly, continuous growth and the spread of consumer-oriented lifestyles throughout the world are producing ever more visibly devastating ecological and social effects globally.⁵⁶ These make clear that while continuous growth stabilizes social conditions in the core – where the benefits accrue – and has the capacity to mediate contradictions between capital and labour through the redistribution of production and surplus, this constellation becomes increasingly precarious with economic conditions deteriorating for many, even in the centres. And it comes at a price. Such contradictions are actually displaced towards other spheres of life and to the Global South. In effect, the globalization of the ‘imperial mode of living’ threatens to destroy the very achievements on which its ideological power rests. Growth is a powerful stabilizing mechanism of capitalist modernity – yet it also destabilizes the ecological foundations of human life on this planet.

2.3. Growth as a material process

Growth, we have argued, is a culturally hegemonic idea in modern society. And growth is also a social process driven by accumulation, characterized not only by the relations internal to capitalism, such as capital and labour, exploitation, or alienation, but also by relations that define the struggles on its frontiers, such as appropriation, externalization, and

⁵⁶ Lucas Chancel et al., *World Inequality Report 2022* (Harvard University Press, 2022); Richard Wilkinson and Kate Pickett, *The Spirit Level: Why Greater Equality Makes Societies Stronger* (New York: Bloomsbury Press, 2011).

unequal exchange. Growth, as a social process, dynamically stabilized modern societies. In this section, we discuss growth as a material, biophysical process: the accelerating movement and use of more and more resources, energy, land, consumable goods like food or smartphones, and the resulting waste products and emissions – all of which are considered part of the ‘social metabolism’ of society. Going beyond critically analysing the ideology of growth and the monetary production economy, a critical theory of growth also includes analysing how growth appears in the material world, as a biophysical process, and how its expansive nature produces socio-ecological contradictions.⁵⁷

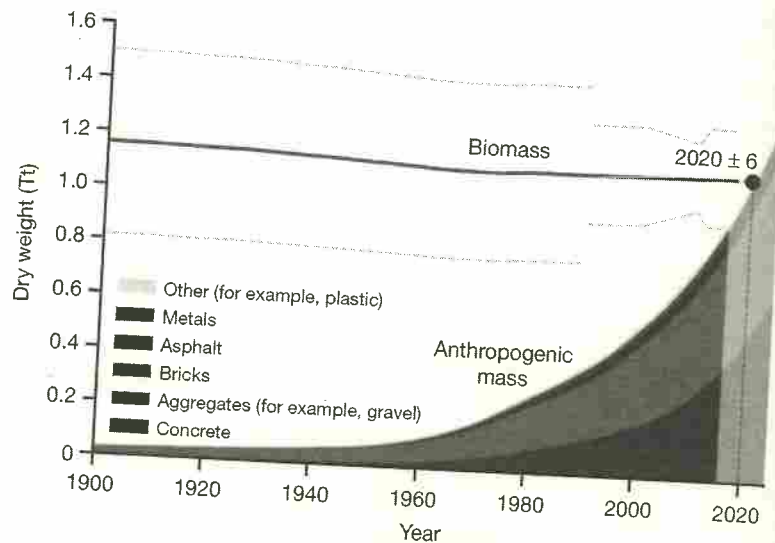


Figure 2.1. Biomass and anthropogenic mass estimates since the beginning of the twentieth century on a dry-mass basis. Source: Emily Elhacham, Liad Ben-Uri, Jonathan Grozovski, Yinon M. Bar-On, and Ron Milo, ‘Global Human-Made Mass Exceeds All Living Biomass’, *Nature* 588, no. 7838 (2020): 442–4.

⁵⁷ John Bellamy Foster, *Marx’s Ecology: Materialism and Nature* (New York: Monthly Review Press, 2000).

One way to get an impression of this material dimension of growth is through scientific analyses that measure the weight of all the mass of the objects produced by humans – from buildings and infrastructure to plastic bottles and smartphones. This research in industrial and political ecology has generated some striking results: since around 1900, this ‘anthropogenic mass’, which consists mainly of concrete, aggregates, bricks, asphalt, and metals, has increased rapidly, doubling roughly every twenty years (see Figure 2.1). Today, human-made stuff equal to each person’s body weight is produced every single week for everyone alive globally. This ‘anthropogenic mass’, which at the beginning of the twentieth century accounted for only about 3 per cent of all biomass (all the trees, shrubs, other plants, animal bodies, and so on) on Earth, surpassed the overall biomass around the year 2020. The mass of produced plastics alone is double the mass of all the terrestrial and marine animals, including the bodies of humans.⁵⁸ How can we conceptualize this material dimension of economic growth – and what ecological and social repercussions does it have?

Accumulation as biophysical growth

Economic growth not only appears as the ‘immense accumulation of commodities’ – the ever-expanding stream of commodified things and beings and the social relations making these possible. Growth is also experienced as biophysical and material change and as the accumulation of stuff. This includes transformations in our environments, as – driven by rising demand for energy – coal mines swallow villages and forests in Germany, the oil industry destroys livelihoods in the Niger delta, or rare earth mining in northern China – critical for electric cars – produces radioactive earth dumps, poisoned groundwater, and replaces Indigenous

⁵⁸ Emily Elhacham et al., ‘Global Human-Made Mass Exceeds All Living Biomass’, *Nature* 588, no. 7838 (2020): 442–4; see also Fridolin Krausmann et al., ‘Global Socioeconomic Material Stocks Rise 23-Fold over the 20th Century and Require Half of Annual Resource Use’, *Proceedings of the National Academy of Sciences* 114, no. 8 (2017): 1880–5; Heinz Schandl et al., ‘Global Material Flows and Resource Productivity: Forty Years of Evidence’, *Journal of Industrial Ecology* 22, no. 4 (2018): 827–38.

populations. Material growth is also experienced through ever larger cities, rising buildings, urban sprawl, or the construction of more highways. Or it appears as diverse agro-economic or pastural systems being continuously replaced by industrial agriculture, factory farming, or monocultural crop production for global agrobusiness.

To understand this biophysical dimension of growth, degrowth offers an analytical apparatus that builds on biophysical and ecological economics (see also section 3.1). Centrally, growth can be analysed as the flows of energy and matter that are passing through societies – extracted in some useful form, put to work or consumed, and eventually emitted as waste. In this metabolic process, these flows are not only sustaining human and non-human bodies, but also the infrastructures and material artefacts that humans have built, which require energy and materials to be sustained and are analysed as ‘stocks’. From this ecological and materialist perspective, economic growth necessarily requires increasing throughput of energy and matter – a fact that tends to be disguised by the focus on GDP or ‘the economy’ in terms of monetary flows.⁵⁹ As will be discussed in more detail throughout the book, while efforts to dematerialize the economy through increased efficiency and the use of renewable energy and resources might change the equation somewhat, they cannot escape the necessary materiality of economic growth.⁶⁰

The social metabolism of capitalism relies mainly on non-circular flows of energy and materials that constantly run through ‘the economy’ and build up as rising stocks or are released as waste. This means that for production to happen, energy and matter must be extracted at

⁵⁹ Marina Fischer-Kowalski and Karl-Heinz Erb, ‘Core Concepts and Heuristics’, in *Social Ecology: Society-Nature Relations across Time and Space*, ed. Helmut Haberl et al., *Human-Environment Interactions* (Cham: Springer International Publishing, 2016), 29–61; Herman E. Daly and Joshua C. Farley, *Ecological Economics: Principles and Applications* (Washington: Island Press, 2011); Pineault, ‘The Growth Imperative of Capitalist Society’, Anke Schaffartzik et al., ‘The Transformation of Provisioning Systems from an Integrated Perspective of Social Metabolism and Political Economy: A Conceptual Framework’, *Sustainability Science*, 18 (2021).

⁶⁰ Schandl et al., ‘Global Material Flows’.

a ‘source’, which creates ecological effects such as the depletion of ecosystems. And after the throughput has been transformed and consumed, it is excreted as waste into a ‘sink’ and must be reintegrated into ecosystems and biological cycles. Again, this causes ecological and biogeochemical effects such as plastic waste polluting oceans or, most critically, carbon emissions driving the climate catastrophe. At sources and sinks, where capitalism encounters nature, the ecological contradictions resulting from accumulation and growth as a material process manifest most clearly – presenting both resistance to capital as well as opportunities for further innovation and renewal. Yet, as will be discussed in depth later, flows are subject not only to economic dynamics, but also to the laws of physics and thermodynamics – which has far-reaching repercussions for the prospects of infinite growth of throughputs, and thus also for the prospects of endless accumulation (see section 3.1).

Within capitalism, the flow of energy and matter through the economy must constantly be kept going or accelerated to increase the output of commodities and thus avert the ever-present spectre of overproduction. As argued by Eric Pineault, to absorb surplus capacity in the form of unused machines (fixed capital) or uninvested profits, output in mass consumer societies is managed in specific ways that allow for more growth:

Commodities, even the most basic, are designed to maximize output consumption: they don’t last long, they are overwrapped, they are disposable or they depend on energy and matter thirsty artefacts that households must collect to enjoy them . . . It is not only that the output must be absorbed and consumed, but it must be consumed in such a way as to make room for the absorption of a continuously expanding output. This is growth.⁶¹

Of course, this material growth, which is driven by competitive efforts to impede the structural crisis of overaccumulation, has disastrous

⁶¹ Pineault, ‘The Growth Imperative of Capitalist Society’, 40. See also Foster, *Marx’s Ecology*; Trentman, *Empire of Things*.

effects at both source and sink. New research has calculated the total amount of resources and energy that is wasted due to throughput being directed by accumulation; it concludes that every year the global economy 'mismanage[s] around . . . 49% of the food produced, 31% of the energy produced, 85% of ores and 26% of non-metallic minerals extracted, respectively'. Consequently, natural resources are being depleted, ecosystems are polluted, and livelihoods depending on these are destroyed.⁶²

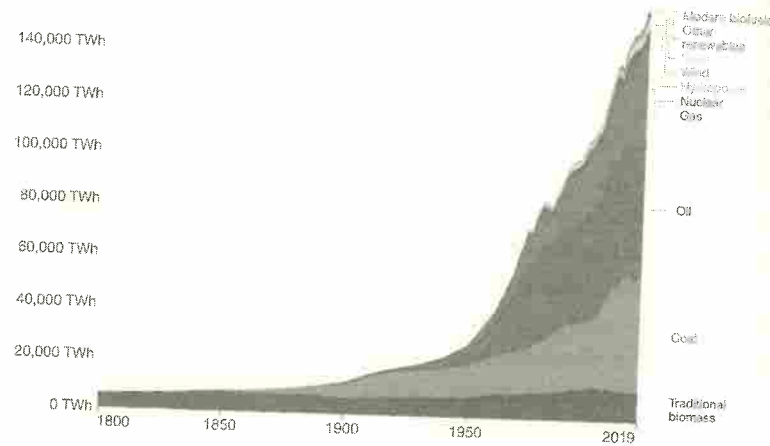


Figure 2.2. Global direct primary energy consumption.

Even as renewables increase exponentially, they are dwarfed by increased use of fossil fuels. Source: Vaclav Smil, *Energy Transitions: Global and National Perspectives* (Santa Barbara: Praeger, 2017), and BP Statistical Review of World Energy; Our World in Data, <https://ourworldindata.org/grapher/global-primary-energy>.

⁶² Marín-Beltrán et al., 'Scientists' Warning against the Society of Waste', *Science of the Total Environment* (2021), 151359. See also section 3.1.

Fossil fuels play a particularly central role in the social metabolism of capitalism.⁶³ Previous societies were dependent on renewable forms of energy. These are ultimately derived from solar energy concurrently in circulation – mostly biomass and land, but also wind and water, and are limited in their ability to scale up production and cannot easily be transported. Thus, people were primarily dependent on available land, biological processes, the specific temporality of plant and animal life, and unchangeable phenomena such as the weather. Fossil fuels fundamentally transformed all that – by giving access to the stored energy of millennia of past photosynthesis, these underground reserves provided an extremely concentrated, powerful, and cheap form of energy. Thus, the entire dynamic of capitalism changed when, in the early nineteenth century, British industrialists started to systematically use coal to fire steam engines. By creating a powerful 'prime mover' that over time came to power anything from the spinning jenny in the cotton factory to Elon Musk's spacecraft, a particularly dynamic and expansive social formation was unleashed: 'fossil capitalism.'⁶⁴

Fossil fuels made it possible to produce increasingly independently of time and space by enabling a constantly available flow of highly concentrated energy that could be increased almost at will, regardless of the specificities of a location. It thus dramatically increased the power of capitalists over the workforce and the production process, which could move wherever labour was cheap and obedient. It also provided the material and energetic basis not only for the expansion of industrial wage labour, but also a previously unknown increase in productivity, an entire range of new mass-produced materials such as steel, cement, and plastic and new forms of increasingly rapid mobility.⁶⁵ During the nineteenth and twentieth centuries, the continuously increasing use of fossil fuels has fundamentally transformed almost all areas of modern societies – from the way we live, fight wars, or grow food to the specific forms of nation-states and

⁶³ Elmar Altvater, 'The Growth Obsession', *Socialist Register* 38 (2009): 73–92.

⁶⁴ Malm, *Fossil Capital*.

⁶⁵ Cara Daggett, *The Birth of Energy: Fossil Fuels, Thermodynamics, and the Politics of Work* (Durham: Duke University Press, 2019); Ghosh, *The Nutmeg's Curse*; Osterhammel, *The Transformation of the World*; Radkau, *Nature and Power*.

geopolitics, gender roles, or the prevalent 'carbon culture'.⁶⁶ Fossil fuels have powered not only economic expansion during this period, but also the increase in societal throughput and the acceleration of other core variables of the Earth system and related social trends. The capitalism of continuous economic growth that we know is fundamentally a fossil capitalism. And while renewable energy has grown exponentially in recent years, this is still comparatively minor and partly offset by the simultaneous growth of fossil fuel energy – instead of a global energy transition, we are largely seeing energy additions (see Figure 2.2).⁶⁷

The great acceleration and ecological crises

The material and social dynamics ushered in by this economic expansion are often illustrated with the now iconic 'great acceleration' graphs. Scientists have calculated and visualized a series of socio-economic and Earth system trends between the years 1750 and 2010.⁶⁸ They show that sustained growth in its various dimensions is a relatively new phenomenon. Only since the nineteenth century have key measurable variables – such as population, water consumption, fertilizer consumption, urbanization, the construction of dams, transport, and so on – begun growing significantly. This process accelerated even more in the middle of the twentieth century, and its trajectory remains largely unbroken to the present day (see Figure 2.3). To understand the trends of the great acceleration, we need to interpret them not only in relation to the physical growth of societies, but as resulting from the dynamics of accumulation as discussed in the previous sections.⁶⁹

⁶⁶ Cara Daggett, 'Petro-Masculinity: Fossil Fuels and Authoritarian Desire', *Millennium* 47, no. 1 (2018): 25–44; Bob Johnson, *Carbon Nation: Fossil Fuels in the Making of American Culture* (Lawrence, KS: University Press of Kansas, 2014); Mitchell, *Carbon Democracy*.

⁶⁷ On this aspect, see in particular the works by Vaclav Smil. For example, Vaclav Smil, *Energy Transitions: Global and National Perspectives* (Santa Barbara: ABC-CLIO, 2017); Vaclav Smil, *Growth: From Microorganisms to Megacities* (Cambridge: MIT Press, 2020).

⁶⁸ Steffen et al., 'Trajectories of the Earth System'. See also Smil, *Growth*.

⁶⁹ Christoph Görg et al., 'Scrutinizing the Great Acceleration: The Anthropocene and Its Analytic Challenges for Social-Ecological Transformations', *Anthropocene Review* 7, no. 1 (2020): 42–61.

This great acceleration has irreversibly changed human life and planet Earth. The concept of the 'Anthropocene', coined by Paul Crutzen and embraced by natural scientists, ecologists, geologists, and historians, describes the age in which humanity itself has become the dominant geological force on Earth. But it is not the abstract 'anthropos' (human being) who is responsible for ecological changes or who has produced them, but a specific mode of (re-)production based on growth and expansion. Some therefore speak of a 'capitalocene' or 'growthocene'.⁷⁰ And despite efforts to delink the growth of GDP from material growth (emissions, material throughput, and energy use), these trends have continued to go up in the aggregate, quickly pushing the global Earth system beyond the limits recommended by scientists.

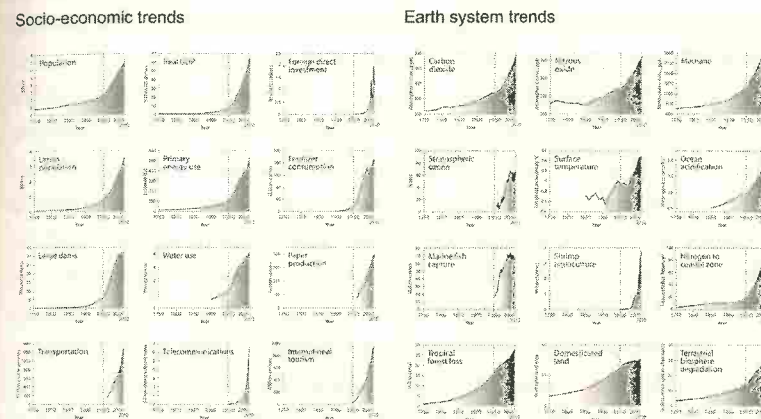


Figure 2.3. The great acceleration. Source: Will Steffen, Wendy Broadgate, Lisa Deutsch, Owen Gaffney, and Cornelia Ludwig, 'The Trajectory of the Anthropocene: The Great Acceleration', *Anthropocene Review* 2, no. 1 (2015): 81–98.

⁷⁰ Jason W. Moore, 'The Capitalocene, Part I: On the Nature and Origins of Our Ecological Crisis', *Journal of Peasant Studies* 44, no. 3 (2017): 594–630; Andreas Malm and Alf Hornborg, 'The Geology of Mankind? A Critique of the Anthropocene Narrative', *Anthropocene Review*, no. 1 (2014): 62–9; Chertkovskaya and Paulsson, 'The Growthocene'.

Indeed, a multiplicity of studies show clearly that most of these trajectories of material growth cannot continue. Already in 1972, the 'Limits to Growth' report to the Club of Rome used an at-the-time ground-breaking computer model to show that continuous rates of growth of economic and material variables would most likely lead to the depletion of key resources by the 2030s. The material limits to growth, this much-discussed report stated, would also imply limits to economic growth in general. In the decades since, different groups of scientists have repeated the modelling from the report with contemporary data and showed that with the exception of some aberrations, current data map quite accurately to the models from 1972.⁷¹ Since then, more and more scientific evidence has cast doubt on the prospects of continuous biophysical growth over the next decades – the growth of stocks and flows of human-made matter, or of the use of energy. This research strengthened the claim that physical limits will eventually also imply an end to economic growth itself.⁷²

In 2009, Johan Rockström's team at the Stockholm Resilience Centre identified nine different 'planetary boundaries' – thresholds which, when crossed, would trigger unpredictable ecological breakdown. Research has since shown that the global economy has already crossed five: *irreversible* climate change, *mass* species extinction, *excessive* land use, the *overburdening* of the nitrogen cycle, and *pollution* by novel entities including plastics and chemicals. The global transformation of nature has already exceeded the 'safe operating space for humanity'. Regarding the other four boundaries – ocean acidification, the depletion of the stratospheric ozone layer, and global freshwater usage – only regional overuse has

⁷¹ Tim Jackson and Robin Webster, *Limits Revisited: A Review of the Limits to Growth Debate* (London: All-Party Parliamentary Group on Limits to Growth, 2016); Graham Turner, *A Comparison of The Limits to Growth with Thirty Years of Reality, Socio-economics and the Environment in Discussion Working Paper Series* (Canberra: CSIRO Sustainable Ecosystems, 2008); Gaya Herrington, 'Update to Limits to Growth: Comparing the World3 Model with Empirical Data', *Journal of Industrial Ecology* 25, no. 3 (2021): 614–26.

⁷² Helmut Haberl et al., 'Contributions of Sociometabolic Research to Sustainability Science', *Nature Sustainability* 2, no. 3 (2019): 173–84; Görg et al., 'Scrutinizing the Great Acceleration'; Schandl et al., 'Global Material Flows'; Jackson, *Prosperity without Growth*; Hickel, *Less Is More*.

occurred thus far, but the situation is deteriorating.⁷³ Exceeding only two of these planetary boundaries – namely, climate change and the loss of biodiversity – has the potential to fundamentally destabilize the Earth system. However, it must be noted that these planetary 'boundaries' are not absolute barriers whose transgression immediately leads to general ecological catastrophes or the end of growth. In particular, the significance of these boundaries is fiercely contested because they affect people very differently, above all depending on their geographical location and their positions in relations of power and domination. However, they do provide a good indication of which systems we are pushing to their limits, beyond which we end up in a future of uncharted, non-linear tipping points. These scientific, empirically rigorous findings justify the conclusion that it is well past time for wide-scale, assertive, and comprehensive action. And, if they were to be reconceptualized as 'societal boundaries' resulting from capitalist social relations, they demonstrate how societies can react differently to these boundaries, including through self-limitation.⁷⁴

Even just to limit climate change driven by human activity – which alone could endanger the survival of large parts of the future human race and other living beings – greenhouse gas emissions must be reduced to zero in less than three decades. A formidable challenge, given the centrality of fossil fuels to the social metabolism of capitalism discussed above. Yet, even if this were to happen, it is uncertain whether self-reinforcing feedback cycles would not continue to drive the Earth system beyond planetary tipping points, preventing climate stabilization and leading to continuous warming and a 'hothouse Earth'.⁷⁵

But it is not just climate change that we are up against. The great

⁷³ Kate Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist* (White River Junction, VT: Chelsea Green Publishing, 2017); Johan Rockström et al., 'A Safe Operating Space for Humanity', *Nature* 461, no. 7263 (2009): 472–5; Linn Persson et al., 'Outside the Safe Operating Space of the Planetary Boundary for Novel Entities', *Environmental Science and Technology* 56, no. 3 (2022): 1510–21.

⁷⁴ Brand et al., 'From Planetary to Societal Boundaries'.

⁷⁵ Will Steffen et al., 'Trajectories of the Earth System in the Anthropocene', *Proceedings of the National Academy of Sciences* 115, no. 33 (2018): 8252–9.

acceleration is affecting all aspects of human–nature interactions – from our water systems to the air we breathe, biodiversity, soil health, the sixth mass extinction, and increased risk of zoonosis, where encroachment into animal habitats leads to novel viral strains causing global pandemics. The writer Charles Eisenstein calls this process a ‘death of a thousand cuts’,⁷⁶ where climate change itself is just one aspect of the multi-faceted degradation of global ecosystems.

Of course, these are only some of the most prominent frameworks that analyse how growth as a biophysical process is disrupting biogeochemical natural systems, approaching, or even surpassing dangerous and partly irreversible tipping points. Yet there is clear and mounting evidence that this process of material expansion – which began with the beginning of industrial, fossil fuel–driven capitalism and accelerated in the 1950s, coinciding with the development of the growth paradigm – is today running up against multiple limits. One of the most distinct signs of the approaching limits is the rising social resistance against the ideology of growth, against social dynamics of accumulation, and against their material form – biophysical growth. People all around the world are resisting, as part of a diverse and growing network of movements against environmental injustice: land defenders, peasants, workers, and Indigenous peoples fighting against successive incursions on their land, against extraction of resources, against demeaning and alienating jobs, and for collectively defined self-limitations and a just transition to a dignified and ecologically sustainable economy.⁷⁷

2.4. The end of growth?

What is the future of growth? Of course, no one knows. But the idea that the global economy will continue to grow at 3 per cent each year,

⁷⁶ Charles Eisenstein, *Climate: A New Story* (Berkeley: North Atlantic Books, 2018).

⁷⁷ See the Environmental Justice Atlas, at ejatlas.org; John Robert McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene since 1945* (Cambridge, MA: Harvard University Press, 2016); Brand et al., ‘From Planetary to Societal Boundaries’.

thus matching some projections and the expectations of what is considered ‘normal’ in economics and public discourse, might turn out not only to be a nightmare (ecologically, but also for many other reasons, as discussed in the next chapter) but also a fantasy. Compounding a 3 per cent annual growth doubles the size of the economy every twenty-four years and, by the end of this century, would lead to a global economy eight times larger. How this can be squared with ecological and social limits is difficult to conceive.

However, since the 1970s, economic growth itself has started slowing, beginning in the early industrialized countries. In the US, Europe, and Japan, growth rates have been declining significantly since the 1970s, a process discussed as ‘secular stagnation’ by economists. The reasons for this are manifold and intertwined. They range from the political structural break from social welfare states towards the neoliberal model, to the tendencies for markets for goods to be saturated, intensified international competition, declining productivity growth, and the financialization of the global economy. Another important factor has been rising resource prices – it is no coincidence that secular stagnation was triggered by the oil crisis of the 1970s. And since the global economy has now become a behemoth, relative growth can only be achieved with ever greater expenditure on materials and energy, which is becoming ever more expensive to provide, in particular with declining rates of productivity.⁷⁸ In the long run, the economy does not seem to be developing in the way of the ‘hockey stick’ we have become accustomed to – stagnating for much of human history and then accelerating into a continuous and almost vertical ascent, like the curve of a ‘J’. Instead, the regions in which capitalist industrialization began earliest now show a transition to a trajectory that can be more adequately described as an ‘S’-curve, in which acceleration slows down and finally comes to a standstill. It could be that, in the long term, the rapid growth of parts of the world economy between the nineteenth and twentieth centuries turns out to be a historical exception.⁷⁹

⁷⁸ Robert J. Gordon, *Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War* (Princeton, NJ: Princeton University Press, 2016).

⁷⁹ Borowy and Schmelzer, *History of the Future of Economic Growth*; Barry

But also in the short term, the future of growth is uncertain – not only given the crisis-tendencies inherent to the social process of accumulation, but also due to the various ecological, social, and material limits of growth. As we look towards the next decades, we will be facing multiple, simultaneous crises, each a result of a global economy based on growth – and increasingly one based on growth in crisis. On the one hand, we are already facing economic stagnation, which is sending tremors through the system of ‘dynamic stabilization’ and upending the expectations of those enjoying an ‘imperial mode of living’, leading to new forms of popular reaction in industrialized and middle-income countries, as well as increasing social divisions. On the other hand, our current energy system, based on fossil fuels, is fast causing a breakdown in the stability of the climate – itself a foundational precondition for welfare, prosperity, and even the very existence of complex human societies. Beyond climate change largely caused by carbon emissions, many parts of the world are facing ecological breakdown and public health crises due to ecosystem degradation, pollution, and high levels of toxicity in food and the environment. All these ecological crises hit the poorest – as well as those oppressed by intersectional hierarchies such as race, class, and gender – first and hardest. These multiple crises are the result of a system dependent on, and driven by, growth.

The main objection to the analyses presented here, which highlights how intricately interwoven the material dimension of growth is with the social process of accumulation, posits that while growth might have been very material and destructive in the past, it is already and can further be dematerialized in the future. The hope is that by shifting to renewable energies, increasing energy and resource efficiency, and through recycling, GDP can be decoupled fast enough from both the use of **resources** (the ‘source’ problems) and the creation of waste and emissions (the ‘sink’ problems). And all of this is already happening in some industrialized countries, the narrative of green, dematerialized, and cyclical growth

Eichengreen, ‘Secular Stagnation: A Review of the Issues’, in *Secular Stagnation: Facts, Causes and Cures*, ed. Richard Baldwin and Coen Teulings (London: CEPR Press, 2014), 41–6; Jackson, *Prosperity without Growth*; Schmelzer, *The Hegemony of Growth*.

claims. However, this hope is based on false assumptions and lacks evidence. While research shows how carbon emissions, GDP, and material footprint have become slightly less coupled, they are still all increasing at a critically dangerous rate (see Figure 2.4). As will be discussed in detail throughout the book (in particular, section 3.1), all the signs of dematerialization or decoupling, as welcome as they are, are simply not enough – growth is still sending us over a cliff.

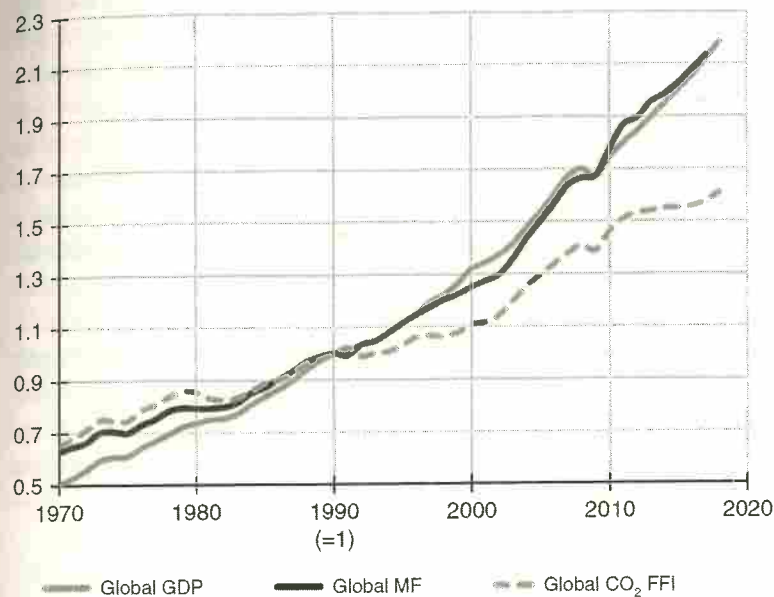


Figure 2.4. Relative change in key global economic and environmental indicators from 1970 to 2017. The graph shows how the global material footprint (MF, equal to global raw material extraction) and global CO₂ emissions from fossil fuel combustion and industrial processes (CO₂ FFI) changed compared with global GDP (constant 2010 USD). Indexed to 1 in 1990. Source: Thomas Wiedmann, Manfred Lenzen, Lorenz T. Keyßer, and Julia K. Steinberger, ‘Scientists’ Warning on Affluence’, *Nature Communications* 11, no. 1 (2020): 1–10.

In this chapter, we have discussed growth as expanding social metabolism of society with nature, which in ever faster rhythms allows more and more resources to flow through 'the economy' and remain as waste and emissions. We have also discussed growth as a social process of mutually reinforcing and dynamically stabilizing forces of acceleration, escalation, and intensification. And we analysed growth as an ideology, focusing on the making and power of the growth paradigm. With regard to each of these, growth ultimately undermines the foundations on which it is based. Yet the hegemony of the growth idea still persists. This is where the critiques of growth come in, which we will discuss in detail in the third chapter and which continue the arguments only outlined here. For a transition to a degrowth society – as we will discuss in chapters 4, 5, and 6 – all three dimensions of growth must be addressed. First, degrowth takes seriously the material dimension of growth in all its complexity, drawing attention to what this means for a future of global justice. Second, degrowth must seriously examine the question of how the self-reinforcing growth dynamics of expansive modernity can be overcome without jeopardizing the social, cultural, and democratic achievements that have been accomplished, largely through social struggles, but also within the context of growth societies. And third, degrowth must critically engage with and dismantle but also transform the promises, myths, and hopes associated with the growth paradigm.

3

Critiques of growth

When first confronted with the word 'degrowth', many people react by calling its proponents anti-modern (You want us to go back to living in caves!), privileged (You want people to have less but many people are already poor!), or apolitical (You don't talk about the root of the problem, which is capitalism!). In part, people often react this way because growth continues to be seen as the provider of all the good things that society offers, so to go against this common sense raises many people's ire, both on the right and on the left.

Another reason is that, while it is easy to react negatively to the word 'degrowth', truly understanding the degrowth framework takes a much more dedicated engagement with the arguments it advances – which are based on both scientific evidence and political theory. In the previous chapter, we took you through some of the history of growth – from its more recent rise as a paradigm of governance to its deeper roots, both material and social, within capitalism. Uniquely among leftist critiques of capitalism, degrowth offers a rigorous understanding of these growth dynamics. In this chapter, we describe the various critiques of growth upon which degrowth literature has drawn, assembling in one place the different frameworks that together make up a degrowth perspective.

Degrowth, we argue, can be understood as a synthesis of different strands of growth critiques, which analyse the dynamics of growth in