

Doughnut Economics:  
Seven Ways to Think Like a 21st-Century Economist  
by Kate Raworth

Chapter One

Change the Goal:  
From GDP to the Doughnut

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# CHANGE THE GOAL

from GDP to the Doughnut

Once a year the leaders of the world's most powerful countries meet to discuss the global economy. In 2014, for instance, they met in Brisbane, Australia, where they discussed global trade, infrastructure, jobs and financial reform, stroked koalas for the cameras, and then rallied behind one overriding ambition. 'G20 leaders pledge to grow their economies by 2.1%' trumpeted the global news headlines – adding that this was more ambitious than the 2.0% that they had initially intended to target.<sup>1</sup>

How did it come to this? The G20's pledge was announced just days after the Intergovernmental Panel on Climate Change warned that the world faces 'severe, pervasive and irreversible' damage from rising greenhouse gas emissions. But the summit's Australian host, then Prime Minister Tony Abbott, had been determined to stop the meeting's agenda from being 'cluttered' by climate change and other issues that could distract from his top priority of economic growth, otherwise known as GDP growth.<sup>2</sup> Measured as the market value of goods and services produced within a nation's borders in a year, GDP (Gross Domestic Product) has long been used as the leading indicator of economic health. But in the context of today's social and ecological crises, how can this single, narrow metric still command such international attention?

To any ornithologist, the answer would be obvious: GDP is a cuckoo in the economic nest. And to understand why you need to know a thing or two about cuckoos, because they are wily birds. Rather than raise their own offspring, they surreptitiously lay their eggs in the unguarded nests of other birds. The unsuspecting foster parents dutifully incubate the interloper's egg along with their own. But the cuckoo chick hatches early, kicks other eggs and young out of the nest, then emits rapid calls to mimic a nest full of hungry offspring. This takeover tactic works: the foster parents busily feed their oversized tenant as it grows absurdly large, bulging out of the tiny nest it has occupied. It's a powerful warning to other birds: leave your nest unattended and it may well get hijacked.

It's a warning to economics too: lose sight of your goals and something else may well slip into their place. And that's exactly what has happened. In the twentieth century, economics lost the desire to articulate its goals: in their absence, the economic nest got hijacked by the cuckoo goal of GDP growth. It is high time for that cuckoo to fly the nest so that economics can reconnect with the purpose that it should be serving. So let's evict that cuckoo and replace it with a clear goal for twenty-first-century economics, one that ensures prosperity for all within the means of our planet. In other words, get into the Doughnut, the sweet spot for humanity.

### **How economics lost sight of its goal**

Back in Ancient Greece, when Xenophon first came up with the term *economics* he described the practice of household management as an art. Following his lead, Aristotle distinguished *economics* from *chrematistics*, the art of acquiring wealth – in a distinction that seems to have been all but lost today. The idea of economics, and even *chrematistics*, as an art may have suited Xenophon, Aristotle and their time, but two thousand years later, when Isaac Newton discovered

the laws of motion, the allure of scientific status became far greater. Perhaps this is why, in 1767 – just forty years after Newton’s death – when the Scottish lawyer James Steuart first proposed the concept of ‘political economy’, he defined it no longer as an art but as ‘the science of domestic policy in free nations’. But naming it as a science still didn’t stop him from spelling out its purpose:

The principal object of this science is to secure a certain fund of subsistence for all the inhabitants, to obviate every circumstance which may render it precarious; to provide every thing necessary for supplying the wants of the society, and to employ the inhabitants (supposing them to be free-men) in such a manner as naturally to create reciprocal relations and dependencies between them, so as to make their several interests lead them to supply one another with their reciprocal wants.<sup>3</sup>

A secure living and jobs for all in a mutually thriving community: not bad for a first stab at defining the goal (despite the tacit disregard of women and slaves that came with the times). A decade later, Adam Smith had a go at his own definition but followed Steuart’s lead in considering political economy to be a goal-oriented science. It had, he wrote, ‘two distinct objects: to supply a plentiful revenue or subsistence for the people, or, more properly, to enable them to provide such a revenue or subsistence for themselves; and secondly, to supply the state or commonwealth with a revenue sufficient for the public services’.<sup>4</sup> This definition not only defies Smith’s ill-deserved modern reputation as a free-marketeer, but also keeps its eyes firmly on the prize by articulating a goal for economic thought. But it was an approach that would not last.

Seventy years after Smith, John Stuart Mill’s definition of political economy started the shift in focus by recasting it as, ‘a science which traces the laws of such of the phenomena of society as arise from the combined operations of mankind for the production of

wealth'.<sup>5</sup> With this, Mill began a trend that others would further: turning attention away from naming the economy's goals and towards discovering its apparent laws. Mill's definition came to be used widely, but by no means exclusively. In fact for nearly a century the emerging science of economics was defined rather imprecisely, leading the early Chicago School economist Jacob Viner, in the 1930s, to quip simply that 'Economics is what economists do.'<sup>6</sup>

Not everyone found that a satisfactory answer. In 1932, Lionel Robbins of the London School of Economics stepped in with intent to clarify the matter, clearly irritated that 'We all talk about the same things, but we have not yet agreed what it is we are talking about.' He claimed to have a definitive answer. 'Economics,' he declared, 'is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses.'<sup>7</sup> Despite its contortions, that definition seemed to close the debate, and it stuck: many mainstream textbooks still start with something very similar today. But although it frames economics as a science of human behaviour, it spends little time enquiring into those ends, let alone into the nature of the scarce means involved. In Gregory Mankiw's widely used contemporary textbook, *Principles of Economics*, the definition has become even more concise. 'Economics is the study of how society manages its scarce resources,' it declares – erasing the question of ends or goals from the page altogether.<sup>8</sup>

It is more than a little ironic that twentieth-century economics decided to define itself as a science of human behaviour, and then adopted a theory of behaviour – summed up in rational economic man – which, for decades, eclipsed any real study of humans, as we will see in Chapter 3. But, more crucially, during that process, the discussion of the economy's goals simply disappeared from view. Some influential economists, led by Milton Friedman and the Chicago School, claimed this was an important step forward, a demonstration that economics had become a value-free zone, shaking off any normative claims of what ought to be and emerging at last as a 'positive' science focused on describing simply what is. But this created a vacuum

of goals and values, leaving an unguarded nest at the heart of the economic project. And, as every cuckoo knows, such a nest must be filled.

### **Cuckoo in the nest**

This positive approach to economics was the textbook theory that greeted me as I arrived at university in the late 1980s. Like many novice economists, I was so busy getting to grips with the theory of demand and supply, so determined to get my head around the many definitions of money, that I did not spot the hidden values that had occupied the economic nest.

Though claiming to be value-free, conventional economic theory cannot escape the fact that value is embedded at its heart: it is wrapped up with the idea of *utility*, which is defined as a person's satisfaction or happiness gained from consuming a particular bundle of goods.<sup>9</sup> What's the best way to measure utility? Leave aside for a moment the catch that billions of people lack the money needed to express their wants and needs in the marketplace, and that many of the things we most value are not for sale. Economic theory is quick – too quick – in asserting that the price people are willing to pay for a product or service is a good enough marketplace proxy for calculating their utility gained. Add to this the apparently reasonable assumption that consumers always prefer more to less, and it is a short step to concluding that continual income growth (and therefore output growth) is a decent proxy for ever-improving human welfare. And with that, the cuckoo has hatched.

Like hoodwinked mother birds, we student-economists faithfully nurtured the goal of GDP growth, poring over the latest competing theories of what makes economic output grow: was it a nation's adoption of new technologies, its growing stock of machinery and factories, or even its stock of human capital? Yes, these were all fascinating questions, but not once did we seriously stop to ask whether

GDP growth was always needed, always desirable or, indeed, always possible. It was only when I opted to study what was at the time an obscure topic – the economics of developing countries – that the question of goals popped up. The very first essay question that I was set confronted me head-on: *What is the best way of assessing success in development?* I was gripped and shocked. Two years into my economic education and the question of purpose had appeared for the first time. Worse, I hadn't even realised that it had been missing.

Twenty-five years later, I wondered if the teaching of economics had moved on and recognised the need to start with a discussion of what it is all for. So, in early 2015, curiosity drew me to sit in on the opening lecture in macroeconomics – the study of the economy as a whole – for Oxford University's newest intake of economics students, many of whom were no doubt planning to be among the top policymakers and business leaders shaping the world in 2050. As his opening gambit, the senior professor put up on the screen what he called 'The Big Questions of Macroeconomics'. The top four?

1. What causes economic output to grow and to fluctuate?
2. What causes unemployment?
3. What causes inflation?
4. How are interest rates determined?

His list got longer but the questions never aimed higher, to encourage the students to consider the economy's purpose. How had the GDP growth cuckoo so successfully hijacked the economic nest? The answer can be traced back to the mid 1930s – as economists were just settling upon a goalless definition of their discipline – when the US Congress first commissioned economist Simon Kuznets to devise a measure of America's national income. The calculation he made came to be known as Gross National Product, and was based on the income generated worldwide by the nation's residents. For the first time, thanks to Kuznets, it became possible to put

a dollar value on America's annual output and hence its income – and to compare it to the year before. That metric proved to be extremely useful, and it fell into welcoming hands. During the Great Depression, it enabled President Roosevelt to monitor the changing state of the US economy and so assess the impact and effectiveness of his New Deal policies. A few years later, as the country prepared to enter the Second World War, the data underlying the GNP accounts proved invaluable for converting its competitive industrial economy into a planned military one, while sustaining enough domestic consumption to keep generating further output.<sup>10</sup>

Other reasons were soon put forward for pursuing a growing GNP, and similar national accounts were created internationally, so that by the end of the 1950s, output growth had become the overriding policy objective in industrial countries. Eyeing the rise of the Soviet Union, the USA pursued growth for national security through military power, and the two sides became locked in a fierce ideological contest to prove whose economic ideology – the 'free market' versus central planning – could ultimately turn out more stuff. Growth appeared to offer an end to unemployment too, according to Arthur Okun, Chairman of President Johnson's Council of Economic Advisers. His analysis found that an annual 2% growth in US national output corresponded to a 1% fall in unemployment – a correlation which looked so promising that it came to be known as Okun's Law. Soon growth was portrayed as a panacea for many social, economic and political ailments: as a cure for public debt and trade imbalances, a key to national security, a means to defuse class struggle, and a route to tackling poverty without facing the politically charged issue of redistribution.

In 1960, Senator John Kennedy stood for the US presidential election on the promise of a 5% growth rate. When he won, the very first question he asked his chief economic adviser was, 'Do you think we can make good on that five per cent growth promise?'<sup>11</sup> That same year, the US joined other leading industrial countries to set up



the Organisation for Economic Co-operation and Development (OECD), with its first priority being to achieve ‘the highest sustainable economic growth’ – aiming to sustain not the environment but output growth. And that ambition was soon backed up by international GNP league tables showing whose growth was in the lead.<sup>12</sup> In the last decades of the twentieth century, the focus shifted from measuring GNP to today’s more familiar GDP, the income generated within a nation’s borders. But the insistence on output growth remained. In fact it deepened, as governments, corporations and financial markets alike increasingly came to expect, demand and depend upon continual GDP growth – an addiction that lasts to this day, as we will explore in Chapter 7.

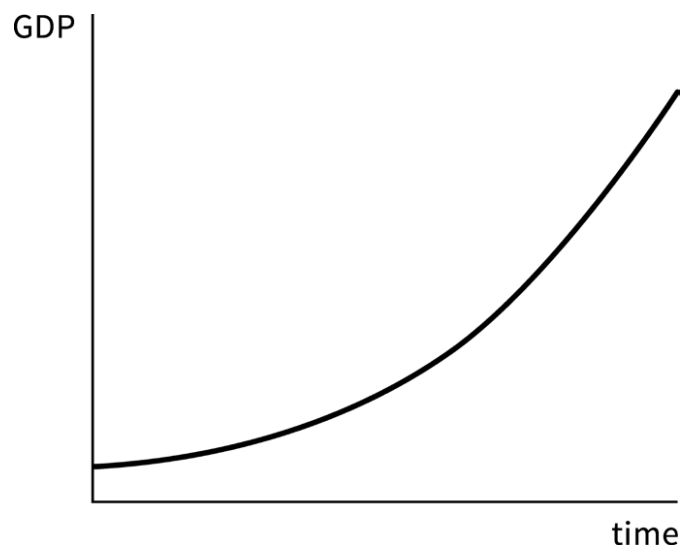
Perhaps it should be no surprise that the GDP cuckoo so deftly filled the economic nest. Why? Because the idea of ever-growing output fits snugly with the widely used metaphor of progress being a movement forwards and upwards. If you have ever watched a child learning to walk, you’ll know just how thrilling that journey is. From clumsy crawling, usually backwards at first, then satisfyingly forwards, they gradually pull themselves up to standing, and take those triumphant first steps. The mastery of this movement – forwards and upwards – charts an individual child’s development, but also echoes the story of progress we tell ourselves as a species. From our lolloping four-legged ancestors evolved *Homo erectus* – upright at last – who gave rise to *Homo sapiens*, always depicted mid-stride.

As George Lakoff and Mark Johnson vividly illustrate in their 1980 classic *Metaphors We Live By*, orientational metaphors such as ‘good is up’ and ‘good is forward’ are deeply embedded in Western culture, shaping the way we think and speak.<sup>13</sup> ‘Why is she so down? Because she faced a setback then hit an all-time low,’ we might say – or, ‘Things are looking up: her life is moving forwards again.’ No wonder we have so willingly accepted that economic success must also lie in an ever-rising national income. It fits with the deep belief, as Paul Samuelson put it in his textbook, that ‘even if more material

goods are not themselves most important, nevertheless, a society is happier when it is moving forward.<sup>14</sup>

What would this vision of success look like if drawn on the page? Curiously, economists rarely actually draw their adopted goal of economic growth (in Chapter 7, we'll return to see why that is). But if they did, the image would be an ever-rising line of GDP: an exponential growth curve moving forwards and upwards across the page, chiming perfectly with our favourite metaphor for human and personal progress.

Kuznets himself, however, would not have chosen this as the picture of economic progress because he was well aware of the limits of his ingenious calculations from the outset. Emphasising that national income captured only the market value of goods and services produced in an economy, he pointed out that it therefore excluded the enormous value of goods and services produced by and for households, and by society in the course of daily life. In addition, he recognised that it gave no indication of how income and consumption were actually distributed between households. And since national income is a flow measure (recording only the amount of income generated each year), Kuznets saw that it needed to be complemented by a



*GDP growth: forwards and upwards.*

stock measure, accounting for the wealth from which it was generated, and its distribution. Indeed, as GNP reached the height of its popularity in the early 1960s, Kuznets became one of its most outspoken critics, having warned from the start that ‘the welfare of a nation can scarcely be inferred from a measure of national income’.<sup>15</sup>

The metric’s creator himself may have offered up that caveat but economists and politicians alike tucked it quietly to one side: the appeal of a single year-on-year indicator for measuring economic progress had become too strong. And so over half a century, GDP growth shifted from being a policy option to a political necessity, and the de facto policy goal. To enquire whether further growth was always desirable, necessary, or indeed possible, became irrelevant, or political suicide.

One person who was willing to risk political suicide was the visionary systems thinker Donella Meadows – one of the lead authors of the 1972 *Limits to Growth* report – and she didn’t mince her words. ‘Growth is one of the stupidest purposes ever invented by any culture,’ she declared in the late 1990s; ‘we’ve got to have an enough.’ In response to the constant call for more growth, she argued, we should always ask: ‘growth of what, and why, and for whom, and who pays the cost, and how long can it last, and what’s the cost to the planet, and how much is enough?’<sup>16</sup> For decades mainstream economists dismissed her views as foolishly radical, but they actually echo those of Kuznets, the hallowed creator of national income itself. ‘Distinctions must be kept in mind,’ he advised back in the 1960s, ‘between quantity and quality of growth, between its costs and return, and between the short and the long term . . . Objectives should be explicit: goals for “more” growth should specify more growth of what and for what.’<sup>17</sup>

### **Evicting the cuckoo**

Knocked sideways by the 2008 financial crash, alarmed by the 2011 Occupy movement’s global resonance, and under growing pressure

to act on climate change, it's no wonder that politicians today have started searching for words to express more inspiring visions of social and economic progress. But they seem always to revert to the same answer: growth, the ubiquitous noun, decked out in a splendid array of aspirational adjectives. In the wake of the financial crisis (while still in the midst of crises of poverty, climate change and widening inequalities), the visions offered up by political leaders started to make me feel like I had stepped into a Manhattan deli, hoping for a simple sandwich, only to be confronted by an endless choice of fillings. *What kind of growth would you like today?* Angela Merkel suggested 'sustained growth'. David Cameron proposed 'balanced growth'. Barack Obama favoured 'long-term, lasting growth'. Europe's José Manuel Barroso was backing 'smart, sustainable, inclusive, resilient growth'. The World Bank promised 'inclusive green growth'. Other flavours on offer? Perhaps you'd like it to be equitable, good, greener, low-carbon, responsible or strong. You choose – just so long as you choose growth.

Should we laugh or cry? First cry, for the lack of vision at such a critical point in human history. Then laugh. Because when politicians feel obliged to prop up GDP growth with so many qualifying terms to give it legitimacy, it's clear that this cuckoo goal is ready for booting from the nest. We evidently want something more than growth, but our politicians cannot find the words, and economists have long declined to supply them. So it's time to cry and to laugh but, most of all, it's time to talk again of what matters.

As we have seen, the founding fathers of political economy were unabashed to talk of what they thought mattered and to articulate their views on the economy's purpose. But when political economy was split up into political philosophy and economic science in the late nineteenth century, it opened up what the philosopher Michael Sandel has called a 'moral vacancy' at the heart of public policymaking. Today economists and politicians debate with confident ease in the name of economic efficiency, productivity and growth – as if

those values were self-explanatory – while hesitating to speak of justice, fairness and rights. Talking about values and goals is a lost art waiting to be revived. With all the awkwardness of teenagers learning to talk about their feelings for the first time, economists and politicians – along with the rest of us – are searching for words (and of course the pictures) to articulate a greater economic purpose than growth. How can we learn to talk again of values and goals, and put them at the heart of an economic mindset that is fit for the twenty-first century?

One promising place to start is by looking to the long lineage of unsung economic thinkers whose aim was to put humanity back at the heart of economic thought. Back in 1819 the Swiss economist Jean Sismondi sought to define a new approach to political economy with human welfare, not wealth accumulation, as its goal. The English social thinker John Ruskin followed him in the 1860s, railing against the economic thinking of his day, declaring that, ‘There is no wealth but life . . . That country is the richest which nourishes the greatest numbers of noble and happy human beings.’<sup>18</sup> When Mohandas Gandhi discovered Ruskin’s book in the early 1900s, he set out to bring its ideas to life on a collective farm in India, in the name of creating an economy that elevated the moral being. In the late twentieth century, E. F. Schumacher – best known for arguing that ‘small is beautiful’ – sought to place ethics and the human scale at the heart of economic thought. And the Chilean economist Manfred Max-Neef proposed that development be focused on realising a set of fundamental human needs – such as sustenance, participation, creativity, and a sense of belonging – in ways that are adapted to the context and culture of each society.<sup>19</sup> Big-picture thinkers such as these have for centuries offered alternative visions of what the economy is for, but their ideas have been kept far from the eyes and ears of economics students, dismissed as the touchy-feely school of ‘humanistic economics’ (begging the question of what the rest of it has been).

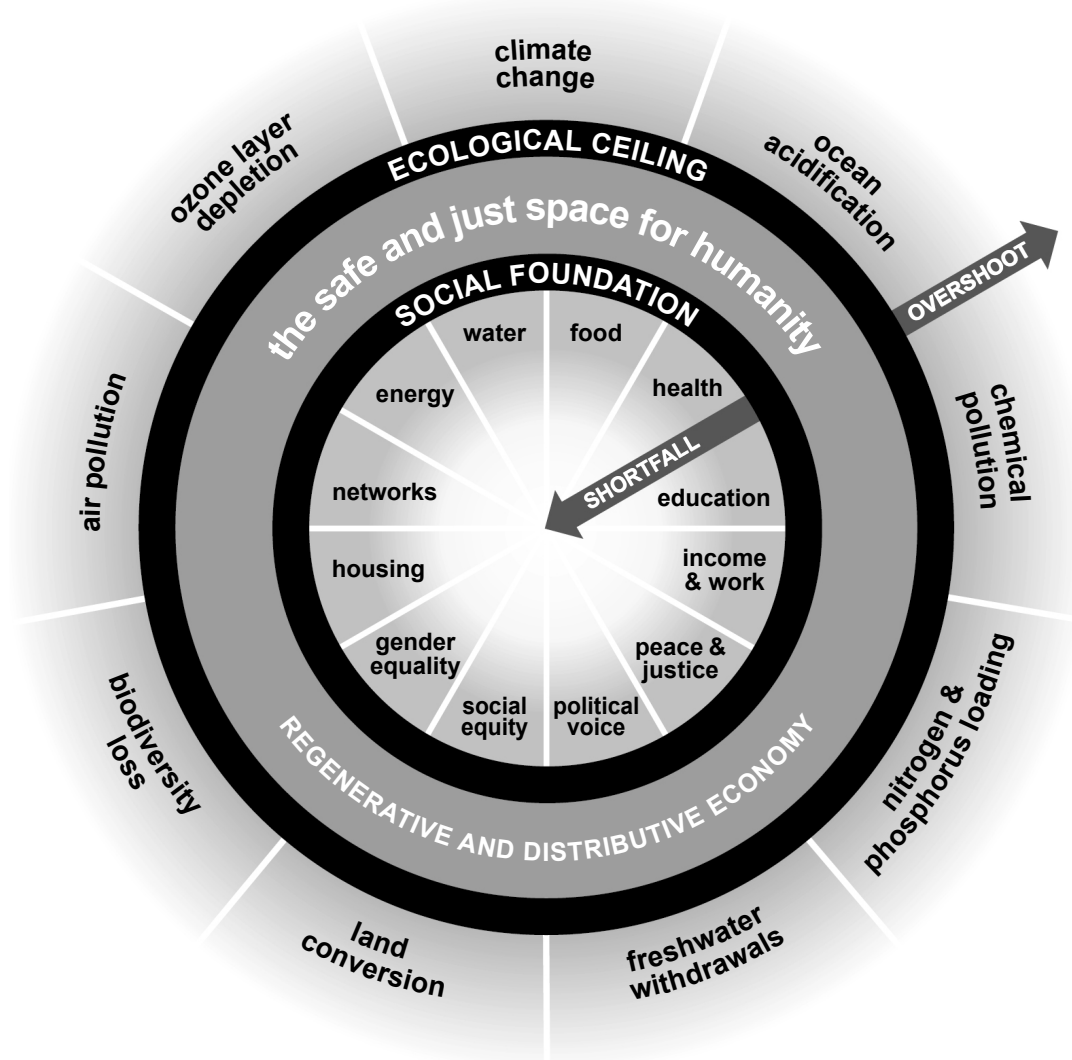
Their humanistic project has, at last, gained far wider attention and credibility. You could say it began to go mainstream with the work of the economist and philosopher Amartya Sen – work for which he won a Nobel-Memorial prize. The focus of development, Sen argues, should be on ‘advancing the richness of human life, rather than the richness of the economy in which human beings live’.<sup>20</sup> Instead of prioritising metrics like GDP, the aim should be to enlarge people’s capabilities – such as to be healthy, empowered and creative – so that they can choose to be and do things in life that they value.<sup>21</sup> And realising those capabilities depends upon people having access to the basics of life – adapted to the context of each society – ranging from nutritious food, healthcare and education to personal security and political voice.

In 2008, the French President Nicolas Sarkozy invited twenty-five international economic thinkers, led by Sen and fellow Nobel-Memorial winner Joseph Stiglitz, to assess the measures of economic and social progress that currently guide policymaking. On surveying the state of indicators in use they came to a blunt conclusion: ‘Those attempting to guide the economy and our societies,’ they wrote, ‘are like pilots trying to steer a course without a reliable compass.’<sup>22</sup> None of us want to be passengers on that directionless jet. We urgently need a way to help policymakers, activists, business leaders and citizens alike to steer a wise course through the twenty-first century. So here’s a compass fit for the journey ahead.

### **A twenty-first-century compass**

First, to get our bearings, let’s put GDP growth aside and start afresh with a fundamental question: what enables human beings to thrive? A world in which every person can lead their life with dignity, opportunity and community – and where we can all do so within the means of our life-giving planet. In other words, we need to get into the

## DOUGHNUT ECONOMICS



*The Doughnut: a twenty-first-century compass. Between its social foundation of human well-being and ecological ceiling of planetary pressure lies the safe and just space for humanity.*

Doughnut. It's the visual concept that I first drew in 2011 while working with Oxfam, and it is inspired by cutting-edge Earth-system science. Over the past five years, through conversations with scientists, activists, academics and policymakers, I have renewed and updated it to reflect the latest in both global development goals and scientific understanding. So let me introduce you to the one doughnut that might actually turn out to be good for us.

What exactly is the Doughnut? Put simply, it's a radically new compass for guiding humanity this century. And it points towards a

future that can provide for every person's needs while safeguarding the living world on which we all depend. Below the Doughnut's social foundation lie shortfalls in human well-being, faced by those who lack life's essentials such as food, education and housing. Beyond the ecological ceiling lies an overshoot of pressure on Earth's life-giving systems, such as through climate change, ocean acidification and chemical pollution. But between these two sets of boundaries lies a sweet spot – shaped unmistakably like a doughnut – that is both an ecologically safe and socially just space for humanity. The twenty-first-century task is an unprecedented one: to bring all of humanity into that safe and just space.

The Doughnut's inner ring – its social foundation – sets out the basics of life on which no one should be left falling short. These twelve basics include: sufficient food; clean water and decent sanitation; access to energy and clean cooking facilities; access to education and to healthcare; decent housing; a minimum income and decent work; and access to networks of information and to networks of social support. Furthermore, it calls for achieving these with gender equality, social equity, political voice, and peace and justice. Since 1948, international human rights norms and laws have sought to establish every person's claim to the vast majority of these basics, no matter how much or how little money or power they have. Setting a target date to achieve all of them for every person alive may seem an extraordinary ambition, but it is now an official one. They are all included in the United Nation's Sustainable Development Goals – agreed by 193 member countries in 2015 – and the vast majority of these goals are to be achieved by 2030.<sup>23</sup>

Since the mid-twentieth century, global economic development has already helped many millions of people worldwide escape deprivation. They have become the first generations in their families to lead long, healthy and educated lives, with enough food to eat, clean water to drink, electricity in their homes, and money in their pockets – and, for many, this transformation has been accompanied by greater equality between women and men, and greater political voice. But global

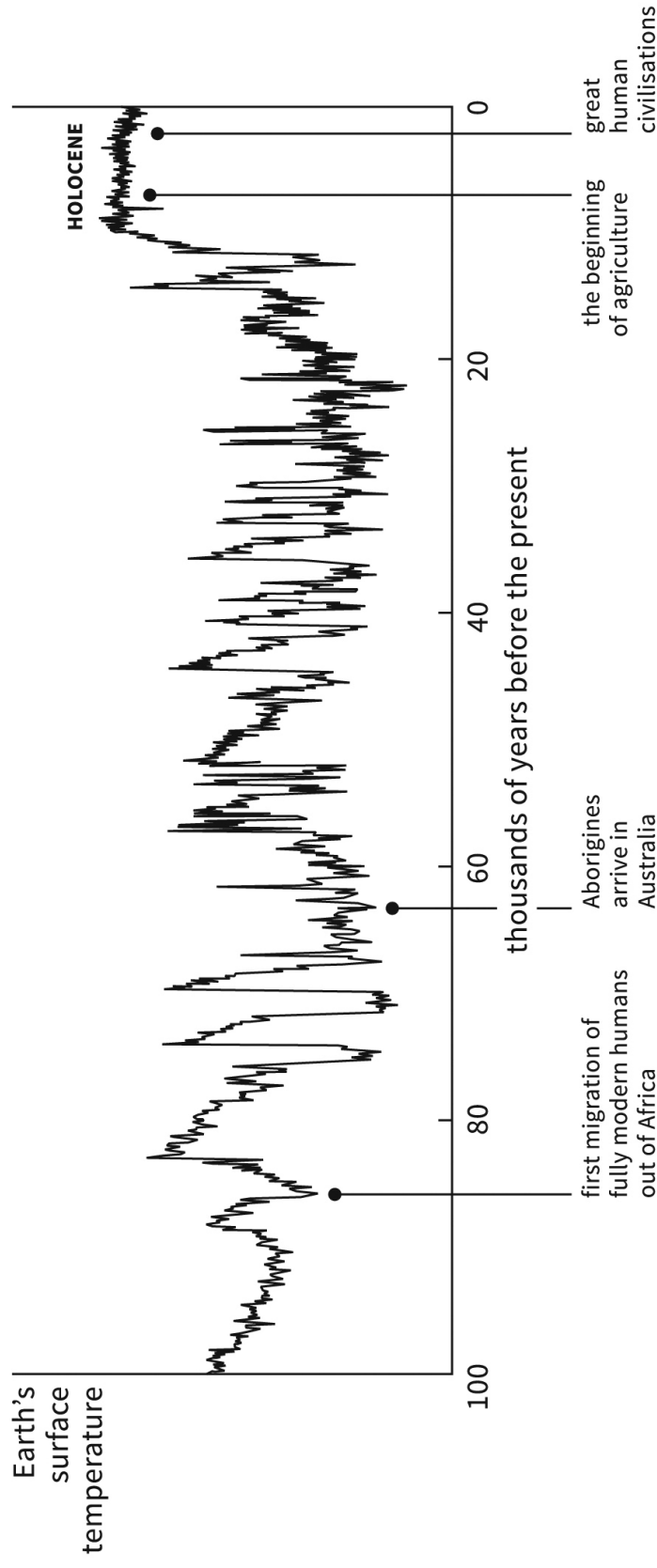


economic development has also fuelled a dramatic increase in humanity's use of Earth's resources, at first driven by the resource-intensive lifestyles of today's high-income countries, and more recently redoubled by the rapid growth of the global middle class. It is an economic era that has come to be known as the Great Acceleration, thanks to its extraordinary surge in human activity. Between 1950 and 2010, the global population almost trebled in size, and real World GDP increased sevenfold. Worldwide, freshwater use more than trebled, energy use increased fourfold, and fertiliser use rose over tenfold.

The effects of this dramatic intensification of human activity are clearly visible in an array of indicators that monitor Earth's living systems. Since 1950 there has been an accompanying surge in ecological impacts, from the build-up of greenhouse gases in the atmosphere to ocean acidification and biodiversity loss.<sup>24</sup> 'It is difficult to overestimate the scale and speed of change,' says Will Steffen, the scientist who led the study documenting these trends. 'In a single lifetime humanity has become a planetary-scale geological force . . . This is a new phenomenon and indicates that humanity has a new responsibility at a global level for the planet.'<sup>25</sup>

This Great Acceleration in human activity has clearly put our planet under pressure. But just how much pressure can it take before the very life-giving systems that sustain us start to break down? In other words, what determines the Doughnut's ecological ceiling? To answer that question, we have to look back over the past 100,000 years of life on Earth. For almost all of that time – as early humans trekked out of Africa and blazed a trail across continents – Earth's average temperature spiked up and down. But during just the last 12,000 years or so, it has been warmer, and far more stable too. This recent period of Earth's history is known as the Holocene. And it is a word well worth knowing because it has given us the best home we've ever had.

Agriculture was invented on many continents simultaneously during the Holocene and scientists believe that this was no coincidence. The newfound stability of Earth's climate made it possible for



*Home sweet home in the Holocene. The graph shows Earth's changing temperature over the past 100,000 years, based on data from the Greenland ice core. The last 12,000 years have been unusually stable.<sup>26</sup>*

the descendants of hunter gatherers to settle down and live by the seasons: anticipating the rains, selecting and planting seeds, and reaping the harvest.<sup>27</sup> It is likewise no coincidence that all great human civilisations – from the Indus Valley, Ancient Egypt, and Shang Dynasty China to the Mayans, Greeks and Romans – emerged and flourished in this geological epoch. It is the only known phase of our planet's history in which billions of human beings can thrive.

More extraordinarily, scientists suggest that, if undisturbed, the Holocene's benevolent conditions would be likely to continue for another 50,000 years due to the unusually circular orbit that Earth is currently making of the sun – a phenomenon so rare that it last happened 400,000 years ago.<sup>28</sup> This is certainly something to sit back and ponder. Here we are on the only known living planet, born into its most hospitable era which, thanks to the odd way we happen to be circling the sun right now, is set to run and run. We would have to be crazy to kick ourselves out of the Holocene's sweet spot, but that is, of course, exactly what we have been doing. Our growing pressure on the planet has turned us, humanity, into the single biggest driver of planetary change. Thanks to the scale of our impact, we have now left behind the Holocene and entered uncharted territory, known as the Anthropocene: the first geological epoch to have been shaped by human activity.<sup>29</sup> What will it take, now that we are in the Anthropocene, to sustain the benevolent conditions that we knew in our Holocene home: its stable climate, ample fresh water, thriving biodiversity, and healthy oceans?

In 2009 an international group of Earth-system scientists, led by Johan Rockström and Will Steffen, took on this question and identified nine critical processes – such as the climate system and the freshwater cycle – that, together, regulate Earth's ability to maintain Holocene-like conditions (all nine are described more fully in the Appendix). For each of these nine processes, they asked how much pressure it can take before the stability that has allowed humanity to thrive for thousands of years is put in jeopardy, tipping Earth into an

unknown state in which novel and unexpected changes are likely to happen. The catch, of course, is that it is not possible to pinpoint exactly where danger lies and, given that many of the shifts could be irreversible, we'd be wise not to find out the hard way. So the scientists proposed a set of nine boundaries, like guard-rails, where they believe each danger zone begins – equivalent to placing warning signs upstream of a river's treacherous but hidden waterfalls.

What do those warning signs say? To avoid dangerous climate change, for example, keep the concentration of carbon dioxide in the atmosphere below 350 parts per million. In terms of limiting land conversion, ensure that at least 75% of once-forested land remains forested. And when it comes to using chemical fertilisers, add at most 62 million tonnes of nitrogen and 6 million tonnes of phosphorus to Earth's soils each year. There are, of course, many uncertainties behind these top-level numbers – including questions about the regional implications of such global limits – and the science is continually evolving. But in essence, the nine planetary boundaries create the best picture we have yet seen of what it will take to hang on to the home-sweet-home of the Holocene, but to do so in the human-dominated age of the Anthropocene. And it is these nine planetary boundaries that define the Doughnut's ecological ceiling: the limits beyond which we should put no further pressure on the planet if we want to safeguard the stability of our home.

Together, the social foundation of human rights and the ecological ceiling of planetary boundaries create the inner and outer boundaries of the Doughnut. And they are, of course, deeply interconnected. If you are itching to pick up a pen and start drawing arrows on the Doughnut to explore how each of the boundaries might affect the others, you've got the idea – and the Doughnut will soon start to look more like a bowl of spaghetti.

Take, for example, what happens when hillsides are deforested. Land conversion of this kind is likely to accelerate biodiversity loss, weaken the freshwater cycle, and exacerbate climate change – and

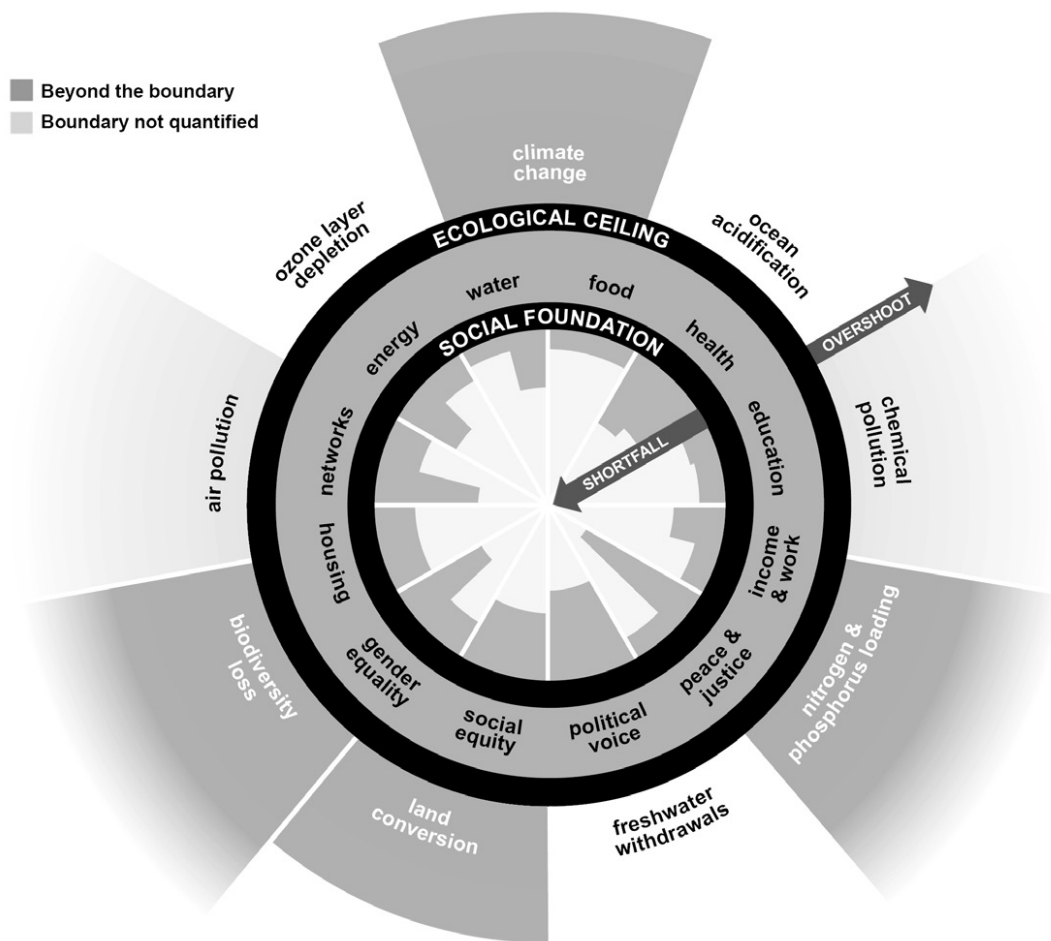
these impacts, in turn, put increased stress on remaining forests. Furthermore, the loss of forests and secure water supplies may leave local communities more vulnerable to outbreaks of disease and to lower food production, resulting in children dropping out of school. And when kids drop out of school, poverty in all its forms can have knock-on effects for generations.

Knock-on effects can, of course, be positively reinforcing, too. Reforesting hillsides tends to enrich biodiversity, increase soil fertility and water retention, and help sequester carbon dioxide. And the benefits for local communities may be many: more diverse forest food and fibre to harvest; greater security of water supply; improved nutrition and health; and more resilient livelihoods. It may be tempting, for simplicity's sake, to seek to devise policies addressing each one of the planetary and social boundaries in turn, but that simply won't work: their interconnectedness demands that they each be understood as part of a complex socio-ecological system and hence be addressed within a greater whole.<sup>30</sup>

Focusing on these many interconnections across the Doughnut, it becomes clear that human thriving depends upon planetary thriving. Growing sufficient, nutritious food for all requires healthy, nutrient-rich soils, ample fresh water, biodiverse crops, and a stable climate. Ensuring clean, safe water to drink depends upon the local-to-global hydrological cycle generating plentiful rainfall and continually recharging Earth's rivers and aquifers. Having clean air to breathe means halting emissions of toxic particulates that create lung-choking smog. We like to feel the warmth of the sun on our backs, but only if we are protected from its ultraviolet radiation by the ozone layer, and only if greenhouse gases in the atmosphere are not turning the sun's warmth into catastrophic global warming.

If moving into the safe and just space that lies between the Doughnut's inner and outer boundaries is our twenty-first-century challenge, the obvious question is this: how are we doing? Thanks to data advances in both human rights and Earth science, we have a

## CHANGE THE GOAL



*Transgressing both sides of the Doughnut's boundaries. The dark wedges below the social foundation show the proportion of people worldwide falling short on life's basics. The dark wedges radiating beyond the ecological ceiling show the overshoot of planetary boundaries (for complete data see the Appendix).*

clearer picture than ever before. Despite unprecedented progress in human well-being over the past 70 years, we are far beyond the Doughnut's boundaries on both sides.

Many millions of people still live below each of the social foundation's dimensions. Worldwide, one person in nine does not have enough to eat. One in four lives on less than \$3 a day, and one in eight young people cannot find work. One person in three still has no access to a toilet and one in eleven has no source of safe drinking water. One child in six aged 12–15 is not in school, the vast majority

of them girls. Almost 40% of people live in countries in which income is distributed highly unequally. And more than half of the world's population live in countries in which people severely lack political voice. It is extraordinary that such deprivations in life's essentials continue to limit the potential of so many people's lives in the twenty-first century.

Humanity has, at the same time, been putting Earth's life-giving systems under unprecedented stress. In fact we have transgressed at least four planetary boundaries: those of climate change, land conversion, nitrogen and phosphorus loading, and biodiversity loss. The concentration of carbon dioxide in the atmosphere now far exceeds the boundary of 350 parts per million (ppm): it is over 400ppm and still rising, pushing us towards a hotter, drier, and more hostile climate, along with a rise in sea level that threatens the future of islands and coastal cities worldwide. Synthetic fertilisers containing nitrogen and phosphorus are being added to Earth's soils at more than twice their safe levels. Their toxic run-off has already led to the collapse of aquatic life in many lakes, rivers and oceans, including a dead zone the size of Connecticut in the Gulf of Mexico. Only 62% of land that could be forested still stands as forest and even that land area continues to shrink, significantly reducing Earth's capacity to act as a carbon sink. The scale of biodiversity loss is severe: species extinction is occurring at least ten times faster than the boundary deems safe. No wonder that, since 1970, the number of mammals, birds, reptiles, amphibians and fish worldwide has fallen by half.<sup>31</sup> Although the global scale of chemical pollution has not yet been quantified, it is of great concern to many scientists. And human pressure on other critical Earth-system processes – such as freshwater withdrawals and ocean acidification – continues to rise towards planetary-scale danger zones, creating local and regional ecological crises in the process.

This stark picture of humanity and our planetary home at the start of the twenty-first century is a powerful indictment of the path of global economic development that has been pursued to date.

Billions of people still fall far short of their most basic needs, but we have already crossed into global ecological danger zones that profoundly risk undermining Earth's benevolent stability. In this context, what could progress possibly look like?

### **From endless growth to thriving in balance**

'Onwards and upwards' may be a deeply familiar metaphor for progress but, in terms of the economy that we know, it has taken us into dangerous terrain. 'Humanity can affect the functioning of its own life-support systems,' says the ocean scientist Katherine Richardson. 'There are tipping points we are pushing on. How does this change our definition of progress?'<sup>32</sup>

For over 60 years, economic thinking told us that GDP growth was a good enough proxy for progress, and that it looked like an ever-rising line. But this century calls for quite a different shape and direction of progress. At this point in human history, the movement that best describes the progress we need is *coming into dynamic balance*, by moving into the Doughnut's safe and just space, eliminating both its shortfall and overshoot at the same time. That calls for a profound shift in our metaphors: from 'good is forward-and-up' to 'good is in-balance'. And it shifts the image of economic progress from endless GDP growth to thriving-in-balance in the Doughnut.

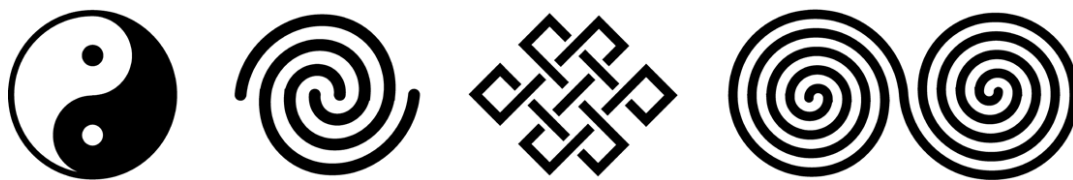
The image of the Doughnut, and the science behind it, may be new but the sense of dynamic balance that it invokes resonates with decades of thinking about sustainable development. The idea of Earth as a spaceship – a self-contained living capsule – gained popularity in the 1960s, prompting the economist Robert Heilbroner to point out that, 'As in all spaceships, sustained life requires that a meticulous balance be maintained between the capability of the vehicle to support life and the demands made by the inhabitants of the craft.'<sup>33</sup> In the 1970s, the economist Barbara Ward – a pioneer of



sustainable development – called for global action to tackle both the ‘inner limits’ of human needs and rights and the ‘outer limits’ of the environmental stress that Earth can endure: she was effectively drawing the Doughnut with words rather than with a pen.<sup>34</sup> Later, in the 1990s, the campaigning organisation Friends of the Earth advocated the concept of ‘environmental space’, arguing that all people have the right to an equitable share of water, food, air, land, and other resources within the carrying capacity of the Earth.<sup>35</sup>

In some cultures, the idea of thriving in balance goes back much further. *Pan metron ariston* said the Ancient Greeks: ‘all things in good measure is best’. In Maori culture, the concept of well-being combines spiritual, ecological, kinship and economic well-being, interwoven as interdependent dimensions. In Andean cultures, *buen vivir* – literally ‘living well’ – is a worldview that values ‘a fullness of life in a community with others and with Nature’.<sup>36</sup> In recent years, Bolivia has incorporated *buen vivir* into its constitution as an ethical principle to guide the state, while Ecuador’s constitution became the world’s first, in 2008, to recognise that Nature, or Pachamama, ‘has the right to exist, persist, maintain and regenerate its vital cycles’.<sup>37</sup> Such holistic and balanced conceptions of well-being are reflected in the traditional symbols of many ancient cultures, too. From Taoism’s yin yang and the Maori takarangi to Buddhism’s endless knot and the Celtic double spiral, each design invokes a continual dynamic dance between complementary forces.

Western cultures seeking to oust the cuckoo goal of GDP growth cannot simply put an Andean or Maori worldview in its place, but



*Ancient symbols of dynamic balance: the Taoist yin yang, Maori takarangi, Buddhist endless knot, and Celtic double spiral.*

must find new words and pictures to articulate an equivalent vision. What might the words for that new vision be? A first suggestion: *human prosperity in a flourishing web of life*. Yes, that is a mouthful to say – and it’s telling that we lack more concise ways of expressing something so fundamental to our well-being. As for the new picture? The Doughnut, I discovered, has a role to play.

In late 2011, in the run-up to a major United Nations conference on sustainable development, I headed to the UN in New York in order to present the Doughnut to representatives from a wide range of countries, to gauge their reaction to it. I met first with the Argentinians since they were, at the time, chairing the Group of 77, the largest negotiating bloc of developing countries at the UN. As I explained the Doughnut to the Argentine negotiator, she tapped the picture firmly with her finger and said, ‘I have always thought of sustainable development like this. If only you could get the Europeans to see it this way too.’ So the following day I went, with curiosity, to present the Doughnut to a roomful of European officials. Once I had projected the Doughnut on to the screen and explained its core idea, the British representative spoke up. ‘This is interesting,’ he said. ‘We hear the Latin Americans talk of “Pachamama” and find it all a bit fluffy’ – wagging his hands in the air as if to illustrate – ‘but I can see that this is a science-based way of saying something that’s actually not so different.’ Sometimes pictures can bridge a divide that words cannot cross.

Given just how far out of balance we currently are – transgressing both sides of the Doughnut – the task of coming into balance is daunting. ‘We are the first generation to know that we’re undermining the ability of the Earth system to support human development,’ says Johan Rockström. ‘This is a profound new insight and it is potentially very, very scary . . . It is also an enormous privilege because it means that we are the first generation to know that we now need to navigate a transformation to a globally sustainable future.’<sup>238</sup>

Imagine, then, if ours could be the turnaround generation that started putting humanity on track for that future. What if we each were to mentally map our own lives on to the Doughnut, asking ourselves: how does the way that I shop, eat, travel, earn a living, bank, vote and volunteer affect my personal impact on social and planetary boundaries? What if every company strategised around a Doughnut table, asking itself: is our brand a Doughnut brand, whose core business helps to bring humanity into that safe and just space? Imagine if the G20 finance ministers – representing the world’s most powerful economies – met around a Doughnut-shaped conference table to discuss how to design a global financial system that served to bring humanity into that sweet spot. These would be world-changing conversations.

In some countries, companies and communities, such conversations are actually under way. From the UK to South Africa, Oxfam has published national Doughnut reports, revealing how far each nation is from living within a nationally defined safe and just space.<sup>39</sup> In Yunnan Province, China, research scientists have made a Doughnut analysis of the social and ecological impacts of industry and farming around Lake Erhai, the region’s key source of water.<sup>40</sup> Companies ranging from Patagonia, the US-based outdoor clothing manufacturer, to Sainsbury’s supermarkets in the UK, have used the Doughnut to help rethink their corporate strategies. And in Kokstad, South Africa – the fastest-growing town in KwaZulu Natal – the local municipality has teamed up with urban planners and community groups in using the Doughnut to envision a sustainable and equitable future for the town.<sup>41</sup>

Initiatives like these are ambitious experiments in reorienting economic development, but is the Doughnut’s planetary scale simply too ambitious for economics to handle? Not at all: it is a scale whose time has come. Back in Ancient Greece when Xenophon first posed the economic question, ‘How should a household best manage its resources?’ he was literally thinking about a single household.

Towards the end of his life he turned his attention to the next level up, the economics of the city state, and proposed a set of trade, tax and public investment policies for his home town of Athens. Jump forward almost two thousand years to Scotland, where Adam Smith decisively raised the focus of economics to the next level up again, the nation state, asking why some nations' economies thrived while others stagnated. Smith's nation-state economic lens has gripped policy attention for over two hundred and fifty years, and is entrenched by those yearly statistical comparisons of national GDP. But now faced with a globally connected economy, it is time for this generation of thinkers to take the inevitable next step. Ours is the era of the planetary household – and the art of household management is needed more than ever for our common home.

### **Can we live within the Doughnut?**

The Doughnut provides us with a twenty-first-century compass but what determines whether or not we can actually move into its safe and just space? Five factors certainly play key roles: population, distribution, aspiration, technology and governance.

Population matters, and in an obvious way: the more of us there are, the more resources it takes to meet the needs and rights of all, and that is why it is essential for the size of the human population to stabilise. But here's the good news: although the global population is still growing, since 1971 its growth rate has been falling sharply. What's more, for the first time in human history, its fall has been due not to famine, disease or war, but to success.<sup>42</sup> Decades of public investment in infant and child health, in girls' education, in women's reproductive healthcare, and in women's empowerment have at last enabled women to manage the size of their families. Seen through the lens of the Doughnut, the message is clear: the most effective way to stabilise the size of the human population is to

ensure that every person can lead a life free of deprivation, above the social foundation.

If population matters, distribution matters just as much because extremes of inequality push humanity beyond both sides of the Doughnut's boundaries. Thanks to the scale of global income inequality, responsibility for global greenhouse gas emissions is highly skewed: the top 10% of emitters – think of them as the global carbonistas living on every continent – generate around 45% of global emissions, while the bottom 50% of people contribute only 13%.<sup>43</sup> Food consumption is deeply skewed too. Around 13% of people worldwide are malnourished. How much food would it take to meet their caloric needs? Just 3% of the global food supply. To put that in context, 30%–50% of the world's food gets lost post-harvest, wasted in global supply chains, or scraped off dinner plates and into kitchen bins.<sup>44</sup> Hunger could, in effect, be ended with just 10% of the food that never gets eaten. From these examples it is clear that getting into the Doughnut calls for a far more equitable distribution of humanity's use of resources.

A third factor is aspiration: whatever people consider necessary for a good life. And one of the biggest influences on our aspirations is how and where we live. In 2009, humanity went urban, with over half of us living in cities and towns for the first time in history, and 70% of us are expected to be urbanites by 2050. City living tends to amplify the influence of surrounding crowds and of advertising billboards whose images promise that a better life is just a purchase away, stoking up desire for faster cars and slimmer laptops, for exotic holidays and the latest-craze gadgets. As economist Tim Jackson deftly put it, we are 'persuaded to spend money we don't have on things we don't need to make impressions that won't last on people we don't care about'.<sup>45</sup> Given a fast-growing global middle class, the lifestyles that people aspire to will have clear ramifications for our collective pressure on planetary boundaries.

Urbanisation may fuel consumerism but it also offers an

opportunity to meet many of people's needs – such as for housing, transport, water, sanitation, food and energy – in far more effective ways. Around 60% of the area expected to be urban by 2030 has yet to be built so the technologies used to create that infrastructure will have far-reaching social and ecological implications.<sup>46</sup> Can new transport systems replace traffic queues of private cars with fast and affordable public transport? Can modern urban energy systems replace fossil-fuel power with rooftop networks of solar power? Can buildings be designed to be largely self-heating and self-cooling? Can food for the city be produced in ways that help to store more carbon in the soil, and provide good jobs at the same time? It depends a great deal upon the technological choices that are made.

Governance also plays a pivotal role, from local and city scales to the national, regional and global. Designing governance that is suited to the challenges we face raises deep political issues that confront the long-standing interests and expectations of countries, corporations and communities alike. The global scale, for example, needs governance structures that can reduce humanity's pressure on planetary boundaries in ways that are equitable with respect to the distribution of their regional and national impacts. At the same time, they must be able to take account of complex interactions such as the inextricable linkages between the food, water and energy sectors. And they must be able to respond far more effectively to unexpected events, such as global food price crises, while steering a wise course on emergent technologies. Much will depend upon the twenty-first century creating far more effective forms of governance, on every scale, than have been seen before.

All five of these factors – population, distribution, aspiration, technology and governance – will significantly shape humanity's prospects for getting into the Doughnut's safe and just space, which is why they are all at the heart of ongoing policy debates. But they cannot bring about the scale of transformation required unless we also transform the economic thinking that we bring to bear. We have

left this transformation late in the day – some would say too late. But today's economics students could well be the last generation with a chance of achieving our twenty-first-century goal. They deserve, at the very least, to be equipped with an economic mindset that gives them the best possible chance of succeeding. And so do we all.

The cuckoo goal of GDP growth emerged from an era of economic depression, world war, and cold war rivalry, but it dominated economic thinking for over 70 years. In a few decades' time we will look back, no doubt, and consider it bizarre that we once attempted to monitor and manage our complex planetary household with a metric so fickle, partial and superficial as GDP. The crises of our own times demand a very different goal and we are still in the early days of reimagining and renaming just what that goal should be.

If the goal is to achieve *human prosperity in a flourishing web of life* – and it looks rather like a doughnut – then how can we best think of (and draw) the economy in relation to the whole? As we will discover, the way that economists have traditionally drawn the economy – determining what's included and what's left out of the economic story – has had profound consequences for all that follows.