

Chapter 6

The National Food Strategy: Part One – July 2020

A New Green Revolution

This crisis, painful though it is, may soon pale into insignificance compared to the turbulence created by climate change and the collapse in biodiversity.

The current food system does terrible damage to the environment. Building a better future – one where our food no longer makes us, or our planet, sick – will be the biggest challenge of all.

THERE'S a wise saying, in military circles, about the danger of always preparing for the last war, instead of the war to come. Another crisis will hit the food system, perhaps quite soon. Next time, it will most likely be climate related.

Our current food system proved fairly robust under the particular pressures of COVID-19, but it is not well prepared for the dangers of climate change: floods, droughts, rising sea temperatures and shifting weather patterns, all of which could lead to catastrophic harvest failures and food shortages.

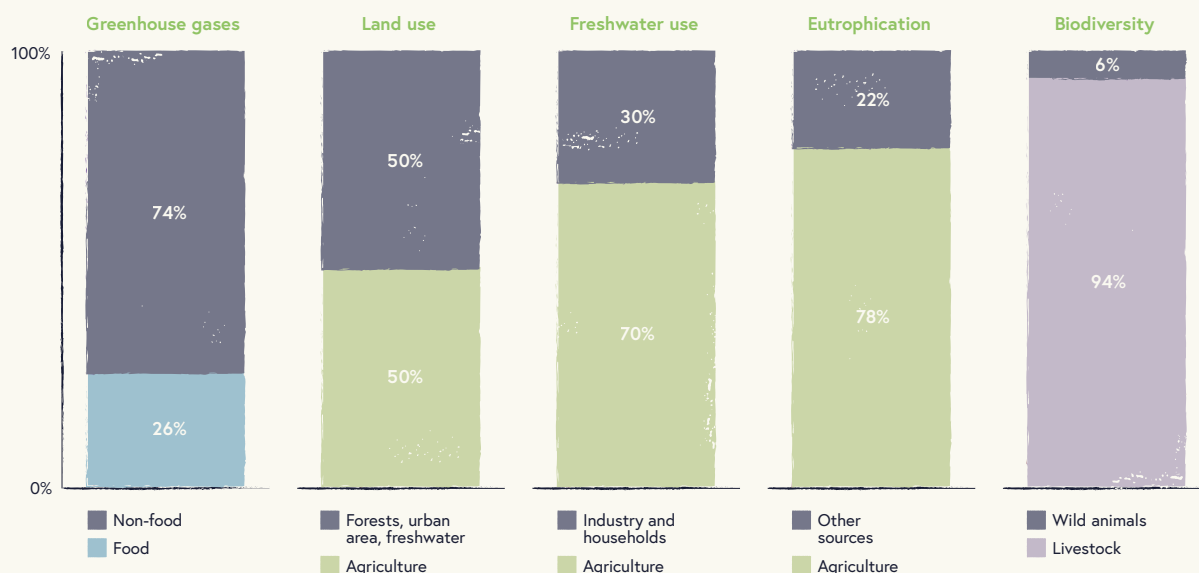
Worse, the food system is a major contributor to climate change. Part Two of this report will cover in some depth the history and effects of the so-called Green Revolution, which began in the 1960s.¹⁷² This was the dawn of modern intensive farming: a new kind of agriculture that used selectively-bred crops alongside fertilisers, pesticides and advanced farm machinery to massively increase the amount of food that could be produced from the land.


For now, suffice to say that what began as a response to the threat of starvation, caused by a booming global population, has been disastrous for the environment.

Every stage of the farming process exacerbates the carbon crisis: the forests cleared to plant crops; the energy-intensive manufacture of fertiliser; the release of carbon from degrading soils; the methane produced by rice paddies and livestock; the energy used by manufacturing plants and retail outlets; and the fuel used to power the vehicles in the supply chain.

The global food system is responsible for an estimated 20-30% of total greenhouse gas emissions.¹⁷³ It occupies half the world's habitable land, uses 70% of the freshwater we consume, causes three-quarters of all water pollution, and is the single biggest contributor to biodiversity loss (see Figure 6.1). The way we produce our food is the mother of all sustainability issues.

Figure 6.1
Globally, food has a very large environmental impact¹⁷⁴





The scale of the problem is unarguable. But the debate over how to solve it has become (like so many debates these days) fiercely tribal. Whether quarrelling over the correlation between meat-eating and greenhouse gas emissions, local versus global supply, genetically engineered foods such as golden rice, or the potential of vertical soil-free farming, the various protagonists are polarised, and the arguments tend towards the moralistic.

The science writer Charles C. Mann analyses this ideological tussle in his book *The Wizard and The Prophet*.¹⁷⁵ In discussions about the environment and sustainability, he says, people tend to fall into one of two tribes. There are the Wizards who – coarsely put – believe that science will come to the rescue, allowing economic growth to continue unimpeded; and there are the Prophets, who believe that we are living so far beyond the planet's means that we must drastically reduce consumption in order to survive.

"Wizards view the Prophets' emphasis on cutting back as intellectually dishonest, indifferent to the poor, even racist (because most of the world's hungry are non-Caucasian)," writes Mann. Following this route, they believe, "is a path toward regression, narrowness, and global poverty". In return, "Prophets sneer that the Wizards' faith in human resourcefulness is unthinking, scientifically ignorant, even driven by greed (because remaining within ecological limits will cut into corporate profits)." Following this route, they say, "at best postpones an inevitable day of reckoning – it is a recipe for what activists have come to describe as 'ecocide'... As the name-calling has escalated, conversations about the environment have increasingly become dialogues of the deaf. Which might be all right, if we weren't discussing the fate of our children."

This problem is amplified by social media, which forces us to entrench. Rather than examining our own positions, we expend all our energy defending ourselves from enemy attack, whether we dismiss that enemy as a luddite, an industry shill or a so-called "watermelon" (green on the outside but commie red on the inside). We seize on evidence that supports our arguments and ignore what doesn't.

Self-righteousness serves only to blind us to complexity and nuance. In the words of Adam Smith: "Virtue is more to be feared than vice, because its excesses are not subject to the regulation of conscience."

The good news is that – within the food system, at least – these tribes are now finding ways to edge closer together. This is partly thanks to the fast-developing science of "complex systems", which is changing perspectives on both sides. In his book *Linked*,¹⁷⁶ the physicist Albert-László Barabási argues that we need to start thinking about nature's networks in a different way. Barabási describes how the hubs and spokes within complex networks (any complex network – the internet, human cells, or the natural food chain) can be arranged and rearranged, and how small changes in their topography can radically change their characteristics.

Until now, scientists have tried to understand nature by disassembling it – breaking matter down into elements and then into electrons and nucleons, for example, or looking at nutrition as simply a matter of vitamins and minerals, proteins and carbohydrates – rather than considering how all the different components work together. We have spent "trillions of research dollars" on this dissection project, "like a child taking apart his favourite toy", he writes. "Now we are close to knowing just about everything there is to know about the pieces. But we are as far as we have ever been from understanding nature as a whole... We have learned that nature is not a well-designed puzzle with only one way to put it back together. In complex systems the components can fit together in so many ways that it would take billions of years for us to try them all. Yet nature assembles the pieces with a grace and precision honed over millions of years".

Improving the complexity of soil is a good example of how this new strand of scientific thinking can bring together the Wizards and the Prophets. Both sides now regard a healthy soil biome as vital to sustainable agriculture: the Wizards because of their faith in network science; and the Prophets because of their instinctive sense that we must work with nature and not against it.

Capsule 3

Getting Serious About Externalities

EVERY economist since Adam Smith has recognised that the incentives of the free market do not work properly if "negative externalities" are not priced into the system.

A negative externality is a cost that falls on a third party when two other parties make a transaction. Suppose, for example, a farmer has a contract to supply carrots to a supermarket. In growing the carrots, he pollutes a nearby watercourse with fertilizer. The cost of that pollution would be a "negative externality" that falls on us, the public, because our environment is polluted. If neither the farmer nor the supermarket (nor indeed the end consumer) is forced to cover the cost of cleaning up the watercourse, the market does not provide any incentive to the farmer to avoid such destructive practices. Which is why negative externalities ought to be priced in.

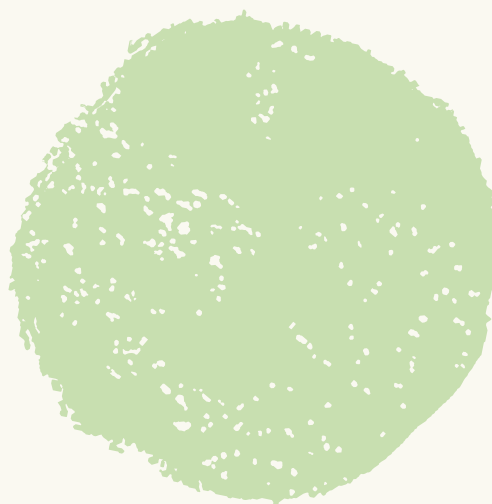
This principle is accepted by economists and politicians of every persuasion. Yet it is almost never applied.

The food system is riddled with negative externalities: polluted water and air, greenhouse gas emissions, antibiotic resistance, biodiversity loss, even the cost of diabetes treatments. All of these are costs imposed on third parties – namely, all of us – by the food system. In theory, they should all be costed into the system.

But they aren't. Worse – they are not even measured. There is no government department in the UK that has any idea, or is even tasked with trying to find out, what the true costs of food production are.

In its "The Hidden Cost of UK Food" report, the Sustainable Food Trust attempted this calculation.¹⁷⁷ It estimated that for every pound we spend on food there is an un-costed 97 pence worth of harm being done to the system. According to this analysis the true cost of our food is almost twice what we pay for it at the till.

It is hard to say whether this is an exaggeration or not. But that is rather the point. We will never understand the scale of the damage that is being done by the lack of accountability within the free market, and what remedies are appropriate, until we invest the appropriate energy into attempting to measure them. I will propose how this could be done in Part Two.



The same is true of the role of the gut biome in diet-related disease, and the recent mathematical modelling that confirmed what Prophets have always known: the greater the biodiversity within an ecosystem, the more robust and productive that ecosystem will be.

It seems to me that our only real hope of creating a sustainable food system lies in diversity: both practical and ideological. A diverse system, in which there are lots of different ways to produce food, is more flexible: if one part of the system gets struck by disaster, the others can pick up the slack. By letting many flowers bloom, we can develop methods of farming and food production that better suit our rapidly changing world.

My ideal Food-topia would contain organic farms as well as solar-powered high-rise greenhouses growing fruit and vegetables in cities; rewilded landscapes, as well as traditional upland farms. I want to see massive investment into biodiversity, but also into agricultural science and innovation, so that farmers can increase their yields and cut back radically on the quantities of chemicals they use. I want weed-picking robots and blight-spotting drones to become as much a part of the landscape as cattle from local native breeds restored to their natural environment.

In the best version of the future, we will still get our sustenance from the seas and the land, but also – at a vastly reduced carbon cost – from proteins fermented in vats fed by solar power. Instead of using pesticides, we will use photons of light of a specific frequency to switch on the immune systems of crops as a natural defence against harmful diseases. None of this is science fiction: these are all real innovations currently being developed in universities across this country.

The Government already has initiatives underway to tackle the problem – its Environmental Land Management (ELM) scheme, for example, which will pay English farmers £2.4 billion a year to deliver public goods, such as capturing carbon and increasing biodiversity.¹⁷⁸ It will transform our countryside if implemented well.

There have been calls to delay ELM on the grounds that farmers already have too much on their plates with EU Exit. I would argue that now is the moment to act. Not only should the Government press on with the scheme, it should accelerate the implementation. Be bolder. Go faster. And get as many farmers as possible onto the pilots before the full planned roll-out in 2024. This will be critical to ensuring we are on track to meet our net-zero goal prior to COP26.

But this is just a start. In Part Two of the National Food Strategy, I will attempt to lay out a blueprint for a better food system: one that no longer makes us, or our planet, sick.

We must build a healthier world, the better to withstand the next big crisis. For all this, we will need the wisdom of both Wizards and Prophets.

Only by bringing true diversity into food and farming can we build a system fit for the future.



The Government should press on with the Environmental Land Management scheme. Be bolder. Go faster.

