

A Little Book about  
**Climate Change**  
And what we might do

by  
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## Introduction

We are used to hearing about the terrible things that may happen as a result of climate change — indeed, ‘climate change’ has morphed into ‘the climate emergency’ and even, ‘the climate crisis’. The media seem almost to relish the reporting of all the bad news and the difficulties that may lie ahead. The iconic image is of a polar bear apparently stranded on a small ice flow, unwilling or unable to swim to safety. This book looks at the challenges that face us and then at possible solutions – focusing in particular on some ideas that do not get a lot of attention in other books or in the media.

### **The Challenges**

The challenges which face us can be broadly grouped under three headings:

1. Global warming leading to climate change. This is mainly as a result of the burning of fossil fuels. Another factor is our agricultural practices (especially, ploughing and meat and dairy production). Also, there are feed-back loops from other environmental changes, such as warming temperatures leading to melting

permafrost, which in turn leads to Methane (a very potent greenhouse gas) escaping into the atmosphere.

2. Over-use of finite resources. In particular, 'peak oil' — meaning that the supply of oil and eventually other fossil fuels will reach a maximum production level and then inevitably supplies will start to run out. What remains before it is all gone will become more and more difficult to access, process and use. (We should note however that exploitation of non-conventional oil reserves — such as via fracking — offers a greatly expanded reserve of fossil fuel. There may be as much as 1,400 times that of conventional resources — although very much more difficult to exploit.)

3. Loss of bio-diversity and loss of habitat for other species as a result of human activities and the expansion of human territory.

## **Meeting the Challenges**

Sustainability with reference to the three challenges set out above would mean:

1. We take action to prevent further climate change so far as possible (mitigation) and to coping with crises already taking place (adaptation).
2. We work towards a smooth and peaceful transition from oil-based economies to ones based on alternative energy and fuel sources.
3. We re-evaluate our relationship with the rest of nature — perhaps giving back areas of

land to return to wilderness as well as assessing the rights of other species with whom we share this planet.

4. We seek to re-evaluate our attitudes with regard to the environment, money and economic growth and to awaken to ways in which our well-being might be understood and realised in other ways. The link between increased consumption (realised through economic growth) and human flourishing might come to be seen as a deeply flawed view of what makes a good society.

Perhaps it is clear that the first two solutions to our challenges — whilst daunting — could nevertheless be viewed as purely technical solutions. It is where many stop, hoping that a Western economic model of growth can be prolonged indefinitely into the future by ongoing technical fixes.

The technical fixes that are available right now are potentially more than sufficient to meet the challenge of climate change. However, the will to implement these fixes and the manner in which they may be implemented depends very much on the motivation for making the changes. Is it to secure an ever-increasing level of material wealth? Or do we recognise new goals and aspirations as individuals, communities and societies? The challenges of the over-use of natural resources and the loss of bio-diversity are less amenable to purely technical solutions. And that's where the third and fourth solutions come into play. We need broader perspectives if we are to meet all our challenges.

We are still very much addicted to stuff as individuals, and societies see material prosperity as what constitutes 'the good life'. So we might solve the climate change problem, but at the expense of still using vast amounts of the Earth's natural resources and taking more and more land away from natural habitats. That might lead to a 'sustainable' world for humans, but if we destroy most of nature in the process, then is it a world we would really like to live in, or to leave to future generations?

Hence, there is more to be considered. How do we meet the challenge of climate change without an excessive reliance on technology? How do we manage our use of natural resources and our other impacts on nature such that all of nature can flourish and not just us humans? These are the questions this book tries to address.

I should say right at the outset that I think we have a future. I am not of the opinion that civilisation will collapse, or indeed, that the whole planet will suffer some kind of 'heat death' through runaway climate change. A century from now we may well have different worries from the ones I have described above. There may be political tensions between the Earth and Mars, problems with animal and plant species that have been 'resurrected' from their DNA and questions over the legal rights of artificial intelligence. Humans will go on changing, inventing and exploring, so there will always be new challenges and looming catastrophes. But the point is, things get solved and we move on. That's not to say that the current issues are not serious. One of the main



concerns of climate change is that we reach a point where the rise in temperature caused by humans pushes nature to the point where further warming occurs because of nature herself, irrespective of what we might do. We'll look at this a bit more in the chapters ahead, but to start with, let's take a closer look at those challenges set out above — the challenges of today — and see if we might find ways of meeting them.

There has certainly been a ramping up of concern over climate change in the last few years, such that it is difficult for governments to ignore public feeling that something must be done. Targets have been set across much of the world. If fully implemented, we would be within a range of 1.5 to 2 degrees centigrade of extra warming (above pre-industrial levels) by 2100 — the target set by the Paris Climate Agreement of 2015.

An important split can be identified between solutions that try to reduce or stop the change and those that accept change is going to happen. The first types of solution are described as 'mitigation'. The second type of solution — living with the changes — is described as 'adaptation'.





## Mitigation

This chapter and the next is looking mainly at climate change — the first of the challenges that we identified in the Introduction. As mentioned, there are two broad approaches to tackling climate change — mitigation and adaptation. Mitigation means to stop or reverse climate change, by whatever means. Adaptation, by contrast, is to accept that change is happening and to change our ways in turn so that we live with how the world is now and is likely to be in the future.

Both mitigation and adaptation aim at achieving sustainability. Sustainability has been defined as ‘...in a broad sense...the capacity to endure. It can be defined as the ability of an ecosystem to maintain ecological processes, functions, biodiversity and productivity into the future. In Biology, the word describes how biological systems remain viable and productive over time. For humans it is the potential for long-term maintenance of well-being, which in turn depends on the well-being of the natural world and the responsible use of resources.’

It also helps first to distinguish between sustainability and 'sustainable development'. Jonathan Porritt, in *Capitalism as if the World Matters*, contrasts these two terms:-

'Sustainability may best be defined as the *capacity for continuance into the long-term future*. Anything that can go on being done on an indefinite basis is sustainable. In that respect, capacity is the end goal, or desired destination, for the human species as much as for any other species.

'By contrast, sustainable development is the process by which we move towards sustainability ... sustainable development is a dynamic process which enables all people to realise their potential and to improve their quality of life in ways that simultaneously protect and enhance the Earth's life-support systems.' (Author's emphasis.)

The phrases, 'sustainable growth' and 'sustainable development' are often used by politicians and others — perhaps trying to give the impression that we can still try to promote business whilst at the same time addressing climate change. Many argue however that such phrases are a contradiction. They would say that all resources are essentially finite and that therefore continual growth in a finite world is impossible. We would be well advised to heed the words of Kenneth E. Boulding, who says: 'Anyone who believes that exponential growth can go on forever in a finite world is either a madman or an economist.'

Because our climate is already changing there is inevitably going to be a bit of both mitigation

and adaptation in whatever we choose to do. Looking at mitigation versus adaptation, something else is clear. Mitigation is a choice, but we may be forced to adapt! We might adapt well or we might adapt badly, but either way, it's not a choice. There are a few sceptics who suggest that we are already beyond a tipping point such that we are now unable to stop climate change from happening. Those feedback loops in nature (such as the sun's heat being absorbed more effectively by water than by ice and the release of methane from thawing permafrost) are driving climate change forward no matter what we might choose to do. So, they conclude, it is mainly about adaptation. But, for now at least, many still believe that there is an opportunity to slow down or stop climate change, so mitigation measures are still important.

## **Who Should Change?**

This brings us to the awkward question of who should be responsible for making the changes that mitigation is asking of us. Let's consider three options: government, the 'producer' (that is, agriculture and industry, especially large-scale industry) and the 'consumer'.

Government could just legislate climate change out of existence right now. Problem solved! To do this they might, for instance, ban the use of fossil fuels. Along with that, they might impose heavy penalties on all forms of pollution. And they might put large areas of the land and the ocean into protected zones where all exploitation of natural resources is forbidden, or strictly limited. Obviously though, such

measures would put many millions of people out of work, cause economic meltdown and no doubt lead to civil unrest, if not world war! More to the point, any government suggesting such immediate and drastic change would likely be thrown out of office by its electorate (if the nation is a democracy) or face civil war in the more autocratic nations of the world. In other words, it's us, the populations of each nation of the world, who determine how far any government can go in legislating for change.

So what about changing agriculture and industry? Well, both farmers and manufacturers must work within the constraints imposed by government, and as I've said above, if those constraints are too tough then the farm or the business will cease trading (or be forced to break the rules). Farmers and manufacturers need a market for what they produce. So again it is consumers who call the shots here.

Granted, sometimes businesses will try to create a market for products that we neither need or really want, by advertising and suggesting to us that we are not fully happy with our lifestyle, our homes, our bodies etc. until we have whatever it is they are trying to sell us. This, and similar arguments, imply that as consumers we are the passive victims of such manipulations by industry. But I think this is a cop-out. I think we can take responsibility for what we purchase, how we live and how we work. For now, we can note that most of us are not politicians, most of us are not in a position to directly decide what farms grow and what businesses produce. But all of us are consumers. As such, we have the power to

force change in society through our choices. So, whilst it might be a contentious point for some, I come down firmly on the side that says it is individual choice that is going to make the difference.

## **What Mitigation Means**

There are a lot of books that explore the various means of mitigating climate change. I am giving just a brief summary here, and also focusing on a few things that get less of a mention but which impact very much on the above conclusion – that it is our own individual change that will drive the wider change in society. I group the mitigation measures under energy, buildings, transport, agriculture, forests, oceans and infrastructure and deal with each one of these below.

### **Energy**

Energy is often the topic most familiar to us in any discussion on climate change. A lot of our energy still comes from fossil fuels. Burning these produces Carbon Dioxide and this builds up in the atmosphere and causes global warming. What's more, fossil fuels are running out, so even without the problems of climate change, we'd have to be looking at alternatives anyway. The good news here is that the development of renewable energy is well under way and it is mostly cheaper than fossil fuels. So the change has gathered its own momentum and the days are numbered for the older power-generation industries.

Let's touch a little on the individual's involvement in all this, since that is the theme I'm seeking to emphasise throughout this book. The first thing to say, when we are looking at providing heating, hot water and power to our homes, is that electricity is always going to be the better option, so far as the planet is concerned. Even if the reader is living in a country where, for the moment, most energy is produced via the burning of fossil fuels, that is likely to change in the near future. Electricity will become increasingly based on renewable sources – increasingly green.

The other thing to consider is whether the household is getting its electricity from the nation's power grid, or if some or all of the energy is provided by the use of 'micro-renewables', such as solar panels, a small wind turbine or a micro-hydro scheme. If a household provides all of its own energy this is often referred to as being 'off-grid'. So we could ask here, is being off-grid worth it? Is it cheaper and is it better for the planet? We'll return to these questions below.

One thing to note is that if the home is relying solely on grid electricity for all its energy needs then it has a problem if there is a power cut. (Many gas- and oil-fired boilers also still need an electricity supply to function.) So it is a good idea to have some back up, at least for heating, and especially in a cold climate. A wood-burning stove is a good option here. (The jury is out on whether burning wood is a positive or a negative for the planet. For the UK at least, our land area to population size would only allow about a tenth of households to burn wood



before we'd need to start importing and then this option tips towards a negative impact on climate over all.)

The next point is that, yes, solar power and such things as ground- and air-source heat pumps (which deliver more heat for a given amount of energy input) will eventually pay for themselves and energy bills will be cheaper. The caveat here is how long will these products last? And the further caveat is to ask: Is it more difficult and expensive over all to have every household fitted with such devices, or would it be better to put all our efforts into a more environmentally friendly grid system?

Along with that, there may be opportunities for district energy and heating schemes that work out cheaper and more efficient than fitting out individual houses. There could, for instance, be a large wind turbine that provides electricity to a village. Or there may be a large heat pump that takes energy from something like a lake or an underground aquifer and delivers the heat to homes at a lower cost than if each home had an individual pump.

Of course, for most of us, our choices are limited, so switching to having a home which is all-electric is probably the most significant thing we could do. There is nevertheless the lure of independence from the big energy providers that micro-renewables can offer us. We asked earlier if going off-grid is worthwhile financially and for the planet. We can say that, for one thing, it is a lifestyle decision that moves people towards self-reliance. That appeals to a lot of people. It is not necessarily a simpler lifestyle. The kit might be quite complex. Even if the

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