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## Chapter 1

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# Introducing Environmental Planning

‘We enjoy the fruits of the plains and of the mountains, the rivers and the lakes are ours, we sow corn, we plant trees, we fertilize the soil by irrigation, we confine the rivers and straighten or divert their courses. In fine, by means of our hands we essay to create as it were a second world within the world of nature.’

(Cicero, *De Natura Deorum II*, 45 BC)

The environment is in a constant state of flux: from frequent local changes to global scale variations between glacial ages. As nature operates continuously in this manner, and on such far-reaching geological timeframes, it can seem almost ahistoric, set apart from the ordinary rhythms of daily life. This sweeping scope and self-renewing character can influence perceptions concerning the extent of humanity’s ability to enact significant environmental change in the pursuit of short-term economic and social benefit. Yet, pick up any newspaper or watch any news channel and there is a good chance there will be a story connected with the environment, many of them framed in negative or even catastrophic terms. Shrinking ice caps, biodiversity loss or devastating floods serve to remind us that humanity can be both subject to powerful natural events and exert its own potent forces in return. Using land and resources modifies the environment, but the relationship is not just in one direction. This process changes perceptions of the natural environment and can impact upon societies more generally, from the value of goods or services to the loss of lives and livelihoods. An awareness of this cyclical relationship is at the heart of managing the environment: we affect nature just as it affects us.

The interdependency between social and natural systems was recognized by the philosopher and socialist Karl Marx, who argued that nature is: ‘man’s inorganic body’ (1975: 328). Not only does it supply the direct means of life, but since our labour changes the

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natural world, it also provides the material for human activity. Therefore, in addition to our connectivity, we also have powers to create anew. The Roman philosopher Cicero discussed this point in the opening quote, as did the geographer Neil Smith describing how the ability to exert a transformative force means that societies can produce a ‘second nature’, a phrase designed to distinguish human changes from the untouched original. With reference to capitalism, Smith (1990: xiv) states: ‘capital transforms the shape of the entire world. No God-given stone is left unturned, no original relation with nature is unaltered, no living thing unaffected’.

Contemporary examples are abundant, from geoengineering to genetically modified crops, and it is clear that the way societies operate can have long-lasting effects that can alter systems as well as operate within them. The relationship is therefore a little more complex than a two-way feedback; the fundamental desire to both use and transform also means that environmental systems, which may be considered instinctively to be too large or plenteous to be affected, are firmly within the scope of humanity’s power. Nature is therefore both our entire surroundings and a human construction; and as such we should take care in how we interact with it.

People may feel more intuitively linked to ‘human’ problems than ‘environmental’ ones, but there are intrinsic connections between environmental, social and economic systems. The BP Deepwater Horizon oil spill provides an illustrative case. In 2010, an oil rig explosion killed 11 crew members and ruptured a well-head that released millions of gallons of crude oil into the Gulf of Mexico. This pollution caused a massive loss of marine wildlife, and the battle to control the oil dominated the global news media for weeks. The official White House report into the causes of the incident makes for interesting reading. Inadequate safety practices and cost-cutting decisions were cited as a cause, and the report even suggested that this problem might be systemic within the petroleum industry more generally (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011). This means that the most high-profile *environmental* issue of recent years had a clear *socio-economic* origin and, in addition to wildlife and biodiversity impacts, it had a great affect on both people’s lives and the balance sheets of multinational companies. So the all-too-frequent demarcation of problems as ‘environmental’ or ‘social’ or ‘economic’ is neither helpful nor accurate as the boundaries between these spheres are difficult to distinguish. Therefore, to fully appreciate ‘environmental problems’ there is a

need to understand the societies within which the environment is constructed, valued and managed. The case also demonstrates that while environmental concerns may naturally lead to the discussion of intervention strategies, such as new regulations or policies, to be effective the wider societal context within which the problem is embedded may need to be considered.

The task of environmental planning is to reflect on the relationship between these aspects and to consider environmental impacts alongside the worldviews and the methods of production that help to determine the role and value of land and resources. Environmental planning scholars have tended to engage increasingly with politics and policy; in reality there are opposing arguments, morals and values within any potential issue, and to engender change these distinctive stances need to be understood and addressed. That is not to say that those concerned with environmental planning should focus on targeting policy-makers. Though seductive as a means of exerting influence, it can mean that any intervention may be directed down institutionally agreeable pathways, or the analysis targeted at more easily understood fixes, rather than the complex underpinning structures and processes apparent in the Deepwater Horizon incident. This requirement suggests a strong link between what some may have initially considered to be distinct topics: the *environment*, *planning*, *politics* and *policy* – an aspect this book is designed to address. In short, to conduct successful environmental planning necessitates an understanding not just of an impact, but also of an awareness of why this has happened, what mechanisms are available to elicit change, and how these can be implemented.

This book essentially concerns the broad topic of environmental planning, an interdisciplinary subject encompassing aspects of the natural and social sciences. It has relevance within a host of discrete subjects, from environmental studies to sociology, and to geography, but is aimed most directly at a planning audience. I would urge readers to resist donning any disciplinary straitjacket or studying aspects in strict isolation, however. As we shall learn, the complexity of many environmental issues reinforces the need for a subtle erosion of knowledge and expertise silos, with issues integrated within societies more generally and how the ‘environment’ may be perceived. I would therefore encourage at least some small engagement with disciplines outside your chosen field or specialism. Consequently, this book will deliberately encompass a wider array of literature than might be expected within a typical

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environmental planning text, touching on aspects such as history, geography, politics and sociology, as well as more mainstream planning and environmental management.

There are two key messages running through this book: environmental problems are also social ones; and that to have effective environmental planning you need to consider broader questions, such as how we live and how decisions are made. Let us now begin to investigate this fascinating subject in more depth by looking at the importance of the discipline, its inherent complexities, and how difficult it can be to intervene effectively.

### **The importance of environmental planning**

You can easily devote entire books to discussing the various meanings and applicability of the term ‘environment’ without achieving a firm consensus, or indeed, any substantial pedagogical value. Equally ‘planning’ can find itself subject to lengthy discussion about precisely what it should encompass, or is frequently pigeon-holed lazily as something procedural or bureaucratic that only ‘planners’ do. In practice, both terms can be defined from a narrow managerial or regulatory perspective, as perhaps a rule to be applied or a law adhered to, but it is when they are considered alongside wider social and economic systems that the terms really come alive.

Here, we sidestep the temptation to become bogged down in the entangled ontology of unequivocal definitions and instead provide a simple answer that encompasses what this book aims to cover. While environmental planning is a hybrid of two separate terms, together they are: ‘concerned with society’s collective stewardship of the Earth’s resources’ (Selman, 2000: 1). And it is related to these general principles of informed spatial intervention over time that this book is positioned. There are critical questions that fundamentally influence any engagement with this topic regardless of *where* you are in the world or even *when* you may be reading the book: how is ‘the environment’ understood? How are these frames of reference interpreted? And how does this lead to judgements, from moral ones to aesthetic, to economic? This book will focus on the contexts, principles and complexity that will gradually give environmental planning more colour and meaning. In this sense, the words environment and planning are framing devices that provide the focus of discussion: in short, they are the lens as well as the subject.

In addition to its encompassing scope, the scale of environmental planning is also noteworthy. As knowledge concerning the extensive influence of human activity has changed over time, so have the requirements for the subject to be conducted across different administrative or political boundaries: from what were initially very local issues to what are now major international concerns. However, this brings new difficulties in gaining political agreement on both possible strategies and the spatial distribution and scale of any threat. To some, particularly those connected with the climate change agenda, we may be in an ‘age of crisis’, where catastrophe is only a few decades away, yet on the other side of the coin, we have powerful short-term concerns about the impact that any remedial measures might have on economies. In reality, most environmental issues are subject to similarly competing viewpoints and a key aim of the book will be to help readers to understand and navigate these.

The argument that environmental regulation or protection may be a barrier to economic growth is well understood; it is a pervasive message of the political and policy spheres and a common discussion in the media throughout the world. As such, environmental planning is often subject to attack and there are frequent calls for its power to be reduced or altered. Yet its contribution to society is immense. The easiest way to appreciate the value of environmental planning is to consider what would happen in its absence. Think about your local neighbourhood or city and reflect on how space and resources would be utilized differently, or how businesses may operate. Green spaces may be built on, buildings constructed to a cheaper standard, watercourses polluted, or cities would operate without the necessary strategic planning to make the whole function more effectively. Now think about the effect, from neighbourly disputes resulting from insensitive house extensions to unchecked urban sprawl, to the degradation of the global commons.

It is also illustrative to consider, when reflecting on these debates, who would *benefit* from an absence of planning. Would it be you, or another group? Would it be a multinational corporation with little concern for local well-being, or perhaps a company that makes money from exploiting environmental resources? In this sense, planning may stake a strong claim to be a ‘public good’ – one of those rare mechanisms whose existence can benefit society as a whole. It is more than merely an ability to control development in the present, however; the inherent potential to plan for the future

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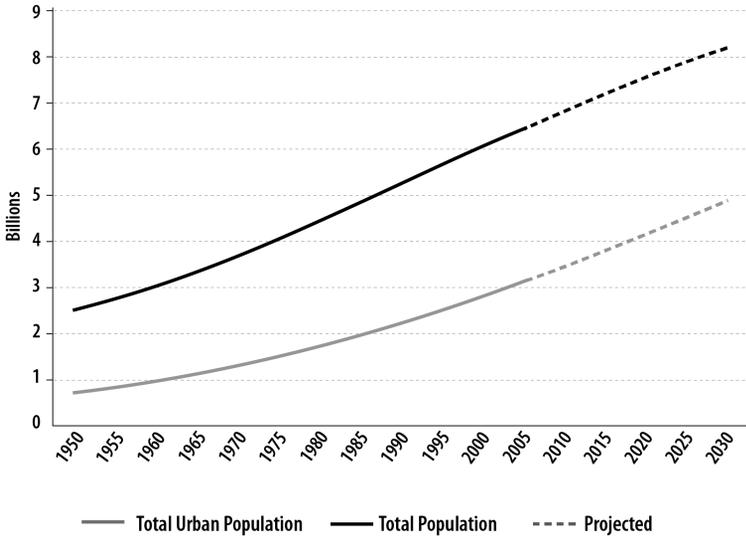
can bring social benefits for generations, as may be seen in the formation of the garden city movement, the establishment of national parks, or the creation of valued civic spaces in any city in the world. Taking a step back and considering this larger perspective, the entire rationale for the planning system may be considered to be a way to prevent the worst excesses of capitalism and its systemic desire for cheap land, low costs and maximum profit.

A final aspect of note with regard to the subject of environmental planning is that it is inevitably a growing concern; in the twenty-first century there will be more pressures on the natural world and a greater need to plan places and spaces that effectively consider the natural and built environments while enabling increases to the quality of life for humankind. There will be more people, more urbanization, an ever-increasing demand for resources, and new pressures on the natural environment. There will also be more knowledge than ever before on the impact of humanity on the planet and a need to balance this with the requirement for growth to proceed and standards of living to rise. The connection between nature and humanity over differing scales means that environmental planning is also a complex subject that argues against a reductionist and fragmented approach. With this in mind, the next section will introduce some of the bigger environmental planning problems, and demonstrate how they are integrated.

### **The complexity of environmental planning**

One of the reasons why humanity has the potential to transform the environment to a degree never previously seen is the sheer number of people on the planet. We shall use this fundamental aspect to trace how impacts occur and how they, in turn, lead to other environmental issues, and so on. Understanding this connectivity is at the heart of successful environmental planning.

During the vast proportion of human history the global population has been estimated to be less than a few million people. Among other factors, this total was constrained by the limited availability of basic resources, poor health and welfare provision, a lack of technological advancement, and local environmental constraints, most notably the restricted supply of energy (Mumford, 1961). The past few centuries have seen an explosion of progress in all of these areas and, as a result, a steep upward trend in global population. At the start of the twentieth century the number of



**Figure 1.1** *World population change*

Source: Adapted from United Nations (2011).

people in the world was estimated to be 1.65 billion. This figure has since increased dramatically, and by 2012 the Earth's population was estimated to be around 7 billion. The number of people on the planet has doubled in the last 40 years and this growth is expected to continue over the coming decades. Dependent on factors such as fertility, the total global population is predicted to be around 9.3 billion by 2050 (United Nations, 2011) (see Figure 1.1).

These people will all have an impact. They build settlements and roads, consume natural resources and require water and land for crops. This means that the extent of the reach of humanity on the Earth's surface is also expanding. It is estimated that over 75 per cent of the ice-free land area can no longer be considered wild (Ellis and Ramankutty, 2008) with the pace of change accelerating alongside population increases. Compare the heavily forested sight of Manhattan that Henry Hudson might have seen as he sailed into the natural harbour in 1609 with the presentday configuration of New York City, and take a moment to reflect on the enormous ecological changes that have been wrought in the equivalent of an eyeblink in geological time. The virgin land has been transformed beyond all recognition: the soil has been levelled, the ponds

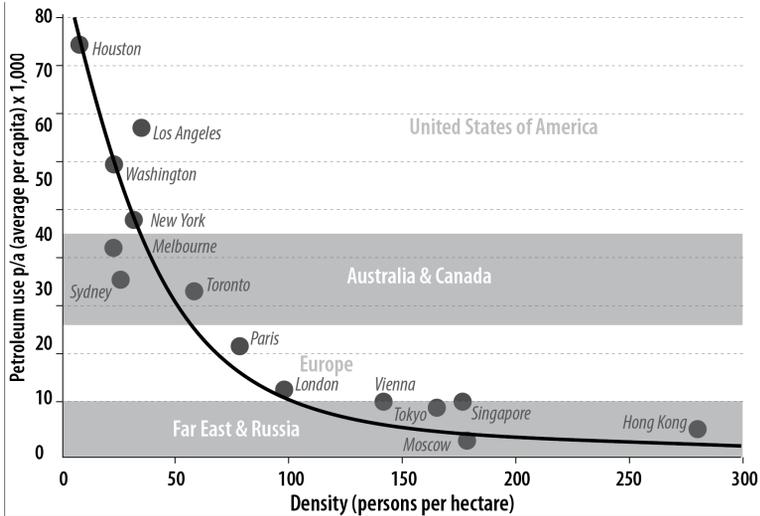
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drained, the trees chopped down, and biodiversity largely eradicated. Then think about what has been created; indisputably one of the greatest cities in the world, and one with an amazing social and cultural richness. The exercise also serves to illustrate that land use change is not necessarily ‘bad’, since benefits may accrue alongside costs. It is the nature of environmental planning to navigate this tricky juncture.

The discussion over the number of people and their demand for resources logically leads to related environmental planning issues, such as population density. The term ‘sprawl’ (later called ‘urban sprawl’) was first used in 1937 by an early planner in the USA to describe the flight of the affluent from the industrial city to more desirable surroundings (Black, 1996). While early cities needed people and industries to be located nearby, advances in fields from energy to infrastructure to technology gradually extended this distance, with daily commutes or remote working now a common feature of modernity. Reflecting on the nature of sprawl over the twentieth century we can also start to appreciate cultural differences in the use of land. For example, density levels in Europe or Asia tend to be much higher than in countries such as the USA, Australia or Canada, related to aspects such as land availability and value, cultural norms and planning constraints. In addition to the social and economic impacts of this trend – from inequality to social homogeneity, to higher financial costs for infrastructure – the environmental effects are also significant, not least with regard to pollution, habitat fragmentation and reducing the viability of public transport options.

Considering this factor also allows us to turn the discussion to the next related issue: energy. Land use is very static; uses do not tend to change much over time and can serve to ‘lock’ trajectories of behaviour decades into the future (Guy *et al.*, 2011). A low density model of living relies on the cheap availability of power to function effectively, which is fine for the fossil-fuel-rich late twentieth and early twenty-first centuries. However, world energy consumption is predicted to grow by 56 per cent between 2010 and 2040, and during this time around 80 per cent of energy will be derived from fossil fuels (US Energy Information Administration, 2013). Regardless of the environmental impacts of extraction, production and consumption, what will be the results of this model from a socio-economic perspective as the price of these fuels rises inexorably because of limited supplies and higher demand associated with the rapid industrialization of countries such as India or



**Figure 1.2** Gasoline use per capita and population density

Source: Newman and Kenworthy (1989).

China? Figure 1.2 explores this spatial and temporal aspect by linking land use patterns with gasoline use. Here, you can imagine how historic decisions on ways to use land may result in citizens in certain countries paying significant amounts of money to move around for many decades into the future.

The use of fossil fuels is also central to managing what is possibly the most critical environmental issue of our time: climate change. It is argued that carbon dioxide (CO<sub>2</sub>) emissions need to be strictly limited to keep the increase in temperature to less than two degrees Celsius, at which point dangerous changes are projected to occur (United Nations, 2009). The impacts on the environment from climate change may be significant and encompassing, from species extinction to ocean acidification to biodiversity loss. Yet humanity is so dependent on fossil fuels for energy, and international negotiations do not appear to be making significant political progress. Environmental planning has a dual role here, both in limiting emissions by thinking about architecture, travel or energy use, and enabling adaptation to manage the effects of a changing climate. Box 1.1 provides a small case study of the development of this particular environmental planning problem.

This small section raises a number of environmental planning concerns that are individually pressing, but collectively compelling.

### Box 1.1 Climate change

While climate change can be presented as an intensely complex and disputed topic, at its heart this is an uncontroversial science, and the basic physics of the effect of greenhouse gases in the atmosphere have been established for a surprisingly long time. Although the degree to which this should be welcomed has hardened since the start of the twentieth century, as this quote from the pioneering Swedish scientist, Svante Arrhenius (1908: 63) demonstrates: ‘By the influence of the increasing percentage of carbonic acid in the atmosphere, we may hope to enjoy ages with more equable and better climates, especially as regards the colder regions of the earth, ages when the earth will bring forth much more abundant crops than at present, for the benefit of rapidly propagating mankind.’

It is accepted that greenhouse gases warm the planet, without which we would have a temperature closer to that of the moon or the planet Mars. Indeed, it was way back in the early nineteenth century that the principle of the greenhouse effect, whereby the Earth’s atmosphere acts as an insulator, was discovered by Joseph Fourier (1768–1830). Physicist John Tyndall (1820–93) further established that CO<sub>2</sub> was a ‘greenhouse gas’. The next step was to investigate more deeply the relationship of the gas to temperature, and in the early twentieth century scientists, most notably the chemist Svante Arrhenius, argued that if CO<sub>2</sub> content changed, so could temperature, calculating that a doubling of CO<sub>2</sub> would lead to an increase of between 1.5°C and 4.5°C. In the 1930s a British engineer, Guy Callendar (1938: 223), further developed this argument by presenting evidence that the burning of fossil fuels can increase the concentration of atmospheric CO<sub>2</sub>, which in turn can warm the Earth. He started a seminal article with the striking words: ‘Few of those familiar with the natural heat exchanges of the atmosphere, which go into the making of our climates and weather, would be prepared to admit that the activities of man could have any influence upon phenomena of so vast a scale. In the following paper I hope to show that such influence is not only possible, but is actually happening at the present time.’

In 1956, a *Time* magazine story entitled ‘Science: One Big Greenhouse’ discussed global warming and interviewed Roger Revelle, one of the leading scholars of the emerging science of climate change. The article argued that the rise in temperature could not only have damaging impacts, such as the melting of ice caps and flooding of coastal cities, but warming may produce further climate forcing within the system. Despite the seemingly catastrophic



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