

5

**The
Environment**



CHAPTER 5

The Environment

Nature, the environment and sociology 157

Defining nature and the environment 157

Sociology and the environment 158

What are environmental issues? 163

Pollution and waste 163

Resource depletion 169

Genetic modification of food 172

Global warming 177

Sociological theories and ecological

sustainability 186

Consumerism and environmental damage 187

Limits to growth and sustainable development 190

Living in the global 'risk society' 193

Ecological modernization 195

Environmental justice and ecological citizenship 197

Conclusion 199

Summary points 200

Further reading 201

Internet links 202

(opposite) The 2004 Indian Ocean earthquake was the third largest ever recorded and caused massive loss of human life.



Just before one o'clock a.m. UTC (Coordinated Universal Time) on 26 December 2004, the largest earthquake in 40 years occurred beneath the Indian Ocean. The earthquake shifted the seabed and displaced hundreds of cubic kilometres of water. A large wave known as a tsunami, caused by the tremor, began moving across the Indian Ocean away from the quake's epicentre at a speed of around 500 miles per hour. As it neared the coast, the tsunami slowed dramatically to just 30 miles per hour and began to increase in height. The tsunami reached the nearest landmass, Aceh in northern Indonesia, just 15 minutes after the initial quake, in many places destroying everything in its path and sweeping debris hundreds of metres inland. Thailand was

156 THE ENVIRONMENT

hit after 90 minutes, Sri Lanka after two hours, the Maldives after three and a half hours; finally, the wave reached the African coast, thousands of miles from the epicentre of the quake, some seven hours after the earthquake that caused it.

The scale of the tragedy was not immediately apparent. By the end of the day on 26 December it was reported that 12,000 people had been killed. A few weeks later the United Nations estimated that more than 175,000 people had died. Most deaths were in Indonesia, where it is thought that around 160,000 people lost their lives. Figures for the total number of people killed around the Indian Ocean vary hugely, but the British Red Cross has estimated a death toll closer to the region of a staggering 1 million. In Sri Lanka more than 30,000 people were killed, more than a 1,000 of whom drowned when an 80-tonne train was lifted off its tracks and submerged under water. In India, just fewer than 10,000 people are thought to have died. Travelling west, the wave caused devastation as far away as Africa, killing around 140 people along the continent's east coast. Many millions of people around the Indian Ocean were left homeless.

Although much sociological research tends to focus on how human institutions and citizens respond to ecological hazards, the 2004 tsunami reminds us that natural processes can be complex and unpredictable. The natural environment is not simply an inert, passive backdrop to the dramas of social life, but is an active force, which often plays a large part in the shaping of societies. The Asian tsunami also shows that in a globalized world, events thousands of miles away have a great impact on everyone's lives.

Although the vast majority of people killed in the tsunami were locals, several thousands were tourists from around the world, many of whom had been enjoying an idyllic Christmas break in the region. For instance, the tsunami claimed the lives of 149 people who were British citizens or had

close links with the UK: the greatest loss of British lives in any one incident since the Second World War and far greater than the number of Britons who died in the terrorist attacks in New York and Washington in 2001. The high loss of life amongst Westerners reflects the processes of globalization. Thailand, where most holiday-makers were killed, has only become a destination for mass tourism in the past two decades or so, as people from the rich world are increasingly prepared to travel further afield for their holidays. The relief effort was also global in scope, as the world's news stations beamed pictures and reports of the suffering around the planet. In rich countries, millions of dollars were donated by the general public and governments, troops and expertise were sent to the region and it was agreed that debt repayments from the worst hit countries should be suspended. In early January 2005, millions of people across Europe stopped what they were doing to take part in a three-minute silence in memory of those killed.

Why should sociologists be interested in events such as the Asian tsunami? Surely this was a 'natural disaster', an example of the massive power of nature? If so, then isn't it the proper subject for environmental scientists and geologists rather than sociologists? After all, what institutional training do sociologists receive on understanding earthquakes or plate tectonics? For most of the twentieth century, this apparently common-sense division of academic labour was taken for granted. Natural scientists investigated the non-human world, while social scientists concentrated on people and their societies. However, by the 1980s and '90s things were changing, as knowledge of global environmental problems emerged and it became much clearer that the fate of the 'natural' and 'social' worlds were inevitably intertwined.

In this chapter we look at ideas of nature and environment and what constitutes an environmental issue, before outlining sociological approaches to the study of such

issues. From here we discuss some important environmental issues, including pollution, resource depletion, genetic modification and global warming before looking at sociological theories of consumerism and the risk society and proposals aimed at dealing with environmental dilemmas such as sustainable development and ecological modernization. The chapter ends with an evaluation of their prospects for success, looking ahead to the future of society–environment relations.

Nature, the environment and sociology

Defining nature and the environment

The environmental issues noted above all seem to involve nature. But ‘nature’ is not a simple word with a single meaning. In fact, dictionary definitions usually describe some twelve distinct meanings of the word. Raymond Williams (1987) says that **nature** is one of the most complex and difficult words in the English language because its dominant meaning has changed over time along with the development of societies.

‘Nature’ can mean something that is *essential* to a person or a thing. Why do some birds build their nests at the same time every year, for instance? We may be told that this is instinctive behaviour and an essential part of the ‘nature’ of birds. In fourteenth-century Europe, however, a new dominant meaning began to emerge. Nature came to be seen instead as a *series of forces* that directed the world and ultimately explained why things happen. For example, even today many people consult astrological charts looking for their birth date-based ‘star sign’ and what guidance it can offer on their life decisions. When they do this, they implicitly draw on the same idea of ‘natural forces’ – in this case the movement of stars and planets – directing human affairs. By the nineteenth century, the dominant

meaning of ‘nature’ had changed again. This time it was seen as the whole *material world of things* rather than as a series of forces. The natural world was a world full of *natural things* – animals, fields, mountains and much more. For instance, there was a trend towards looking at ‘scenery’ as landscapes and pictorials, with nature literally framed for our appreciation and enjoyment.

Two major and related causes of this latest change in meaning were **industrialization**, which shifted people away from working the land in agricultural settings, and **urbanization**, which led to larger human settlements that generated new living environments largely divorced from natural things (Thomas 1984). Nature was seen as an obstacle that society had to tame and overcome in order to make progress, as the popular ideas of nature ‘in the raw’ or nature ‘red in tooth and claw’ suggest.

For a minority of people, nature and society were seen as distinct, but nature was not seen as in need of taming. Instead, it was modern industrial society that was the problem, polluting and wasting nature to feed new urban lifestyles. Wild nature needed protection not domestication. Nevertheless, for both the tamers and the protectors, society and nature were seen as *separate things*. Nature was that which society was not, and vice versa. This meaning remains the dominant one today, though more people would probably now agree with the nature-protectors than did so in earlier periods.

Since the 1950s, use of the word, ‘nature’ has started to give way to another term: the **environment**. Dictionary definitions of ‘environment’ suggest that it is the external conditions or surroundings of people, especially those in which they live or work. David Harvey (1993) notes that this definition can apply to a number of situations. For example, we have a working environment, a business environment and an urban environment. However, none of these environments is what most of us think of when the term is used today. Indeed, this chapter’s



From the seventeenth century onwards, wealthy social groups began to take pleasure in, and appreciate, landscape scenes such as this one, which also became the focus of the 'tourist gaze' (Urry 1990).

title, *The Environment*, does not refer to any of these 'environments'. Most people today would probably expect this chapter to discuss pollution, climate change, animal welfare and so on, indicating that *the* environment has taken on a widespread and

special meaning. *The* environment is assumed to mean all of those non-human, natural surroundings within which human beings exist – sometimes called the 'natural environment' – and in its widest sense this is simply planet Earth as a whole. We will use this as our working definition throughout this chapter.

THINKING CRITICALLY

How satisfactory is our working definition of 'the environment' above? What things would it include and what would it exclude? Should human beings be considered part of nature? If so, explain why many people see human creations such as cities and urban environments as somehow artificial.

Sociology and the environment

In our age of global environmental problems and international environmental movements, sociologists can and must take a direct interest in our relationship to the environment within which we live. But just how can sociology help us to understand environmental issues?

First, sociology can help us to understand how environmental problems are distributed. Although the tsunami in Asia killed people from all over the globe, most of those who died were native to the coastal regions around the Indian Ocean. If it had occurred in the richer countries of the Pacific Ocean, the Pacific Tsunami Warning System, based in the American state of Hawaii, would quickly have alerted the emergency authorities in the endangered countries where the infrastructure should be in place to move people away from the coast before a wave strikes. In 2005, the United Nations began to plan for an early warning system for the Indian Ocean, with money from Western donors. The distribution of risks from the environment varies with other types of environmental issue too. For example, although global warming – the increase in average temperature across the globe – will affect everyone on the planet, it will do so in different ways. Flooding kills many more people in low-lying, poor countries, such as

Bangladesh, where housing and emergency infrastructures are less able to cope with severe weather than in Europe, for instance. In richer countries, such as the USA, the issues raised by global warming for policy-makers are likely to concern indirect effects, such as rising levels of immigration as people try to enter the country from areas more directly affected.

Second, sociologists can provide an account of how patterns of human behaviour create pressure on the natural environment (Cylke 1993). Although the 2004 tsunami was not a direct result of human action, many of the environmental challenges discussed in this chapter are. For example, the levels of pollution produced by industrialized countries would cause catastrophe if repeated in the world's poorer, non-industrial nations. If the impoverished regions of the world are to catch up with the richer ones, then citizens of the rich world are going to have to revise their expectations about constant

Modern consumerism generates huge amounts of waste, much of which has conventionally been simply dumped in landfill sites.



160 THE ENVIRONMENT

economic growth. Sociological theories of capitalist expansion, globalization or rationalization can all help us to understand how human societies are transforming the environment.

Third, sociology can help us to evaluate policies and proposals aimed at providing solutions to environmental problems. For example, some environmental activists and 'green' writers argue that people in the rich countries must turn away from consumerism and return to simpler ways of life living close to the land if global ecological disaster is to be avoided (Devall 1990; Schumacher 1977; Stead and Stead 1996). They argue that rescuing the global environment will thus mean radical social as well as technological change. However, given the enormous global inequalities that currently exist, there is little chance that the poor countries of the developing world will sacrifice their own economic growth because of environmental problems created largely by the rich countries. For instance, some governments in developing countries have argued that in relation to global warming there is no parallel between the 'luxury emissions' produced by the developed world and their own 'survival emissions'. In this way, sociological accounts of international relations and global inequality can clarify some of the underlying causes of the environmental problems we face today.

Sociology's founders – Marx, Durkheim and Weber – paid little attention to what we now call 'environmental issues'. Marx analysed capitalism and its exploitative class relationships (see chapter 1, 'What is Sociology?' and chapter 11, 'Stratification and Social Class'), Durkheim sought to understand the sources of social solidarity and to establish sociology within academic institutions (see chapter 1, 'What is Sociology?' and chapter 3, 'Theories and Perspectives in Sociology'), while Weber investigated the connections between religion, rationality and modern capitalism. The relationship between human societies and the natural environment was not seen as

especially problematic by a majority of people in the societies of the time; nor, therefore, was it a central problem for social scientists. Instead, the important social issues occupying scholars were social inequality, poverty and its alleviation, transforming unhealthy urban living conditions and assessing the future direction of industrial development. The natural environment was very much taken for granted, simply as the backdrop to the much more pressing and urgent social problems generated by industrial capitalism.

Although there are ideas within the work of the classical founders of sociology that have been pursued in an environmental direction by later sociologists, the environment was not a central problem of classical sociology. This situation became increasingly difficult once sociologists began to explore the problems identified by environmental campaigners. Could the classical theories provide any insights into human–environment relations? Do we need to abandon them altogether to understand how environmental problems have come about and how they might be solved? Some sociologists *have* returned to classical sociology, reinterpreting the classics in the light of environmental issues (Dickens 2004; Dunlap et al. 2002; Murphy 1997). However, most have not. Rather, sociological studies of the environment have been characterized by a dispute amongst social constructionist and critical realist approaches over just *how* environmental issues should be studied sociologically.

Social constructionism and critical realism

Social constructionism is an approach to studying social problems, including environmental problems. Social constructionists have investigated how some environmental issues come to be seen as significant while others are seen as less important or are largely ignored (Braun and Castree 1998; Hannigan 2006). Are the environmental problems that are thought to be most important today really the ones which are



For more on social constructionism, see chapter 3, 'Theories and Perspectives in Sociology', and chapter 7, 'Social Interaction and Everyday Life'.

the most serious and in need of urgent action?

Constructionists ask a series of important questions about environmental problems. What is the *history of the problem* and how has it developed? *Who* is making the claim that it is a problem; do they have any vested interest and stand to benefit from doing so? *What do they say* about it and does the evidence support this? *How* do they say it? Do they use scientific, emotional, political or moral arguments and why do they do so? *Who opposes* the claim and on what grounds? Do opponents stand to lose if the claim is successful and could that, rather than the evidence, explain their opposition? Such questions give sociologists a clearly defined role in the study of environmental issues, which no other discipline performs. They also add something new to our understanding of environmental issues and problems.

Social constructionists remind us that all environmental problems are, in part, socially created or 'constructed' by groups of people. Nature never does 'speak for itself', but people do speak on its behalf. This process of construction can be examined, understood and explained. And in doing so, the public should be in a better position to assess whether an environmental problem really is as serious as the claim-makers say it is.

For some sociologists though, constructionism is problematic, particularly when studying environmental issues. Social constructionism tends to be 'agnostic' about the central problem at issue (Irwin 2001). For example, a constructionist study of the depletion of the ozone layer would tell us a lot about how this problem came to be seen as important, what arguments were made about it and who opposed the claim. But on the central question – is the ozone layer really becoming dangerously

depleted? – social constructionism remains agnostic. For environmental activists and those committed to solving environmental problems, this is just not helpful. In short, constructionism tells us a lot about people and social interactions, but nothing about society–environment relations.

An alternative approach, known as 'environmental realism' (Bell 2004) or **critical realism**, attempts to approach environmental issues in a scientific way, which brings together evidence from across the social and natural sciences in order to understand better why environmental problems occur. Critical realism aims to get beneath the surface of the visible evidence to uncover the underlying causes of events and problems (Benton 1994; Dickens 1996, 2004; Martell 1994). In contrast to the agnosticism of social constructionism towards the reality of environmental problems, critical realists are prepared to accept and debate knowledge and evidence from the natural and environmental sciences in its explanations. 'Using your sociological imagination 5.1', on BSE in the UK, illustrates some key points of this approach.

Realist approaches such as that described above require the findings from a range of academic disciplines: biology, zoology, history, sociology, political science and more. Only in this way can we properly explain how and why BSE and vCJD posed such a problem in the 1980s and '90s. Like social constructionists, realists would agree that cows are social as well as natural creatures. Arguing a constructionist case, Alan Irwin says: 'The modern cow is the product of generations of human-controlled cattle-breeding, feeding and housing' (2001: 80). But unlike constructionists, realists search for *causal explanations* and are prepared to explore and debate the natural science of environmental issues in ways that social constructionists do not. Critical realism takes into account the *objective reality* of natural objects and environments, and this means rethinking our sociological theories and concepts with this in mind.

162 THE ENVIRONMENT

USING YOUR SOCIOLOGICAL IMAGINATION

5.1: 'Mad cow disease' in the UK

In 1996, British government ministers admitted the possibility that at least 10 recent human deaths had been caused by a new variant of Creutzfeldt-Jakob Disease (vCJD) in humans, which may have developed as a result of people eating beef infected with Bovine Spongiform Encephalopathy (BSE) during the 1980s. This was a huge shock. Millions of people had eaten beef in this period and, at least theoretically, could develop the disease. How had this happened?

BSE is a fatal neurodegenerative disease of cattle, whose symptoms are similar to those of Creutzfeldt-Jakob Disease (CJD) in human beings. These symptoms include the loss of coordination, nervousness, loss of memory, and aggression (hence 'mad' cows). From the experience of sheep farming, it was thought that BSE could not cross the species barrier into the human population. CJD is a recognized but very rare disease in human beings, but is unrelated to BSE. The UK BSE Inquiry (1998–2000) identified the cause of BSE in cattle as a gene mutation in a single cow (named Cow 133). But the most widely accepted explanation for the *spread* of BSE is that cattle were being fed BSE-infected offal (Macnaghten and Urry 1998: 253–65). The Inquiry Report said that the problem was 'the recycling of animal protein in ruminant feed'.

The Report also noted that the link between BSE and the human vCJD, 'was now clearly established'. As of 7 January 2008, the National

Creutzfeldt-Jakob Disease Surveillance Unit in Edinburgh reports that 163 people have died from vCJD. Meat-rendering practices were changed and new rules brought in to prevent a recurrence, but public confidence in science, politics, regulatory bodies and the meat industry was thoroughly shaken by the episode.

On the face of it, this seems like an episode of a naturally occurring disease in animals, unrelated to social processes. However, the transmission and spread of BSE was the product of decisions taken within the animal feed production system. The previous scientific assumption that BSE would not cross the species barrier was shown to be wrong. BSE-infected beef *did* lead to vCJD in humans. Treating cattle as commercial products and denying their herbivorous nature by feeding them dead cattle produced an unexpected outcome that no one had forecast. A critical realist approach would suggest that to understand this event properly (and therefore to put in place the right measures to prevent it from happening again), we need to know what kind of creatures cows are: what are their natural capacities? We also need to understand human beings to know why the disease had such devastating effects on people. What happens when infected foodstuff finds its way into the human body? We also need to know how the food production system operates and what political and economic decisions were made that allowed dead animals to be fed to others. And we need culturally specific knowledge – just why do so many people eat so much beef in the UK?

From this brief sketch of these two approaches, we can say that social constructionism leads in the direction of a *so-*

THINKING CRITICALLY

What advantages are there in sociologists taking an 'agnostic' stance to environmental problems? Why might this not be such a good idea? How would social constructionists investigate the BSE epidemic and its consequences, as outlined above?

ciology of the environment that explores environmental issues from a conventional sociological position, using concepts and theories from within the discipline. By contrast, critical realism leads towards an *environmental sociology*, which demands the revision of existing sociological approaches to take account of the complex intertwining of society and environment (Sutton 2007). However, as we will see during the chapter, many research studies in this field tend to veer between these two polarized alternatives.

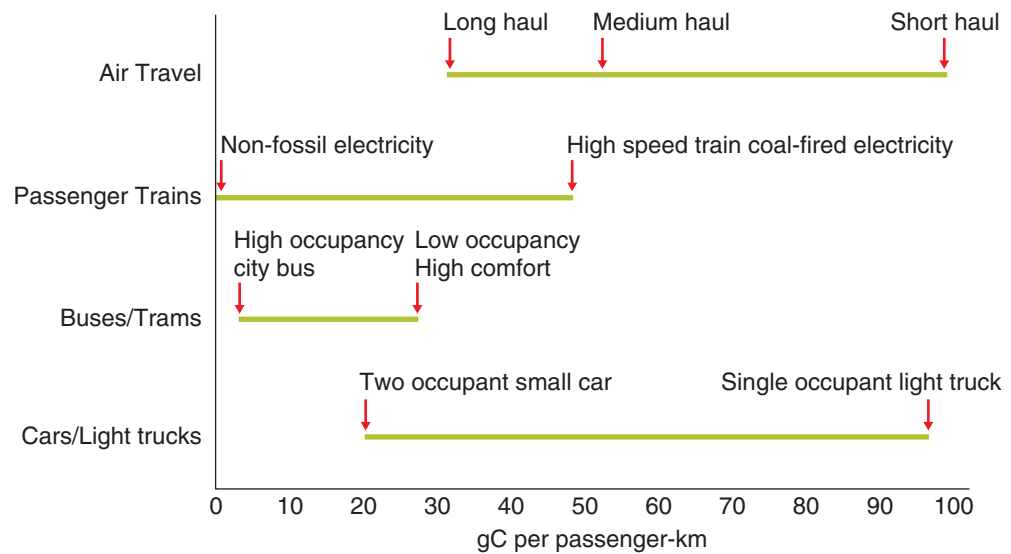


Figure 5.1 European carbon emissions (grams of carbon per kilometre) by mode of transport, 2007

Source: ATAG <http://atag.org/files/PR%20LON-170002A.pdf> (Slide 6, accessed 18 January 2008)

What are environmental issues?

As we have seen, there are many different environmental issues confronting the contemporary world. Some are local or regional in character, while others have an impact on the global human population. However, what they all share and what makes them specifically **environmental issues** is that they involve both social relationships and interactions and non-human, natural phenomena. In this sense, they are *hybrid* issues of society and the environment (Irwin 2001: 26). Keep this point in mind when you read the rest of this section, which covers a range of environmental issues.

Pollution and waste

Air pollution

Air pollution, caused by toxic emissions into the atmosphere, is thought to claim more than 2.7 million lives per year. It is possible to make a distinction between two types of

air pollution: 'outdoor pollution', produced mainly by industrial pollutants and automobile emissions, and 'indoor pollution', which is caused by burning fuels in the home for heating and cooking. Traditionally, air pollution has been seen as a problem that afflicts industrialized countries, with their greater numbers of factories and motorized vehicles. In recent years, however, attention has been drawn to the dangers of 'indoor pollution' in the developing world. It is suggested that more than 90 per cent of deaths linked to air pollution occur in the developing world. This is because many of the fuels that are burned by people in developing countries, such as wood and dung, are not as clean as modern fuels such as kerosene and propane.

Until the middle of the twentieth century, air pollution in many countries was caused primarily by the widespread burning of coal – a fossil fuel – which emits sulphur dioxide and thick black smoke into the atmosphere. In many Eastern European countries and the developing world, the practice remains widespread. Coal was used extensively to

164 THE ENVIRONMENT

heat homes and as power in factories. In 1956, in an attempt to reduce smog, a Clean Air Act was passed in Britain to regulate emissions from chimneys. Smokeless types of fuels, such as kerosene, propane and natural gas, were promoted and are now widely used in the industrialized countries.

Since the 1960s the main source of air pollution has been the growth in the use of motorized vehicles. Vehicle emissions are particularly harmful because they enter the atmosphere at a much lower level than emissions from chimneys. As figure 5.1 shows, the range of emissions that are produced by different types of vehicle is quite large. Cars, which account for some 80 per cent of travel in Europe, have a particularly harmful impact on the environment. A single occupancy car journey can cause the same weight of carbon emissions per kilometre travelled as a long-haul flight. For this reason, attempts to reduce air pollution in many industrialized countries have focused on the use of low-emission travel alternatives such as passenger trains, high occupancy buses and the sharing of car journeys.

Air pollution has been linked to a number of health problems among humans, including respiratory difficulties, cancers and lung disease. Although outdoor pollution has long been associated with industrialized countries, it is growing rapidly in the developing world. As countries undergo rapid processes of industrialization, factory emissions increase and the number of vehicles on the roads also grows. In many developing countries, leaded petrol is still in use, although it has been phased out in much of the developed world. Levels of air pollution were particularly high in many areas of Eastern Europe and the (former) Soviet Union, though economic restructuring and the collapse of industrial manufacturing in these areas has reduced this somewhat since the 1990s.

Air pollution does not only affect the health of human and animal populations; it also has a damaging impact on other elements of the ecosystem. One harmful

consequence of air pollution is acid rain, a phenomenon which occurs when sulphur and nitrogen oxide emissions in one country drift across borders and produce acidic rainfalls in another. Acid rain is harmful to forests, crops and animal life, and leads to the acidification of lakes. Canada, Poland and the Nordic countries have been particularly hard hit by acid rain. In Sweden, for example, 20,000 lakes out of a total of 90,000 have been acidified.

Like many environmental issues, acid rain is difficult to counteract because it is transnational in its origins and consequences. Much of the acid rain in eastern Canada, for example, has been shown as linked to industrial production in the state of New York, across the US–Canadian border. Other countries suffering from acid rain have similarly found that it is not within their control to tackle the problem, since its origins lie across national borders. In some instances, bilateral or regional agreements have been concluded in an attempt to reduce the severity of acid rain. Yet emissions remain high in some areas and are growing quickly in the developing world.

Water pollution

Throughout history, people have depended on water to fulfil a host of important needs – drinking, cooking, washing, irrigating crops, fishing and many other pursuits. Although water is one of the most valuable and essential natural resources, it has also suffered enormous abuse at the hands of human beings. For many years, waste products – both human and manufactured – were dumped directly into rivers and oceans with barely a second thought. Only in the past half century or so have concerted efforts been made in many countries to protect the quality of water, to preserve the fish and wildlife that depend on it, and ensure access to clean water for the human population. Regardless of these efforts, water pollution remains a serious problem in many parts of the world.



Even in lush rainforest where water is abundant, urban settlements, factories and intensive farming practices can make getting access to clean water a difficult task.

One of the 'Millennium Development Goals' set by the United Nations in 2000 is to 'reduce by half the proportion of people without access to safe drinking water' by 2015. Water pollution can be understood broadly to refer to the contamination of the water supply by elements such as toxic chemicals and minerals, pesticides or untreated sewage. It poses the greatest threat to people in the developing world. Currently, more than one billion people around the world lack access to safe drinking water and more than two billion lack sanitation. Sanitation systems remain underdeveloped in many of the world's poorest countries and human waste products are often emptied directly into streams, rivers and lakes. The high levels of bacteria that result from untreated sewage lead to a variety of water-borne diseases, such as diarrhoea, dysentery and hepatitis. Some

two billion cases of diarrhoea are caused annually by contaminated water; five million people die each year from diarrhoeal diseases.

Some progress is being made to improve access to the world's resources of water. During the 1990s, nearly one billion people gained access to safe water and the same number to sanitation, though ensuring safe water supplies remains a problem, particularly in some parts of Africa (UNDP 2002; see also figure 5.2). The problem may actually be worsening as water supplies in developing countries are privatised, raising the cost for customers, whilst the effects of global warming produce more regular droughts (see 'Global Society 5.1').

In industrialized countries, cases of water pollution are often caused by the overuse of fertilizers in agricultural areas. Over a period of years, nitrates from chemical pesticides

Global Society 5.1 The privatization of water

Western companies have the know-how – and the financial incentive – to supply water to poor nations. But, as Richard Wachman reports, their involvement is already provoking unrest ...

Water becomes the new oil as world runs dry

The midday sun beats down on a phalanx of riot police facing thousands of jeering demonstrators, angry at proposals to put up their water bills by more than a third. Moments later a uniformed officer astride a horse shouts an order and the police charge down the street to embark on a club-wielding *melée* that leaves dozens of bloodied protesters with broken limbs.

A film clip from the latest offering from Hollywood? Unfortunately not. It's a description of a real-life event in Cochabamba, Bolivia's third largest city, where a subsidiary of Bechtel, the US engineering giant, took over the municipal water utility and increased bills to a level that the poorest could not afford.

Welcome to a new world, where war and civil strife loom in the wake of chronic water shortages caused by rising population, drought (exacerbated by global warming) and increased demand from the newly affluent middle classes in the emerging economies of Asia and Latin America. At a City briefing by an international bank last week, a senior executive said: 'Today everyone is talking about global warming, but my prediction is that in two years water will move to the top of the geopolitical agenda.'

The question for countries as far apart as China and Argentina is whether to unleash market forces by allowing access to private European and American multinationals that have the technological know-how to help bring water to the masses – but at a price that many may be unable, or unwilling, to pay.

As Cochabamba illustrates, water is an explosive issue in developing countries, where people have traditionally received supplies for free from local wells and rivers. But in the past 15 years rapid industrialisation, especially in places such as

China, has led to widespread pollution and degradation of the local environment.

A report out today from accountancy giant Deloitte & Touche says humans seem to have a peculiar talent for making previously abundant resources scarce: 'This is especially the case with water', it observes. According to the firm's findings, more than one billion people will lack access to clean water by next year. Paul Lee, research director at Deloitte, and one of the authors of the report, says: 'Demand for water is expected to be driven by economic growth and population increases. India's demand for water is expected to exceed supply by 2020.'

The World Wildlife Fund has forecast that in the Himalayas, the retreat of glaciers could reduce summer water flows by up to two-thirds. In the Ganges area, this would cause a water shortage for 500 million people. Lee says: 'The lack of the most important form of liquid in the world is therefore a fundamental issue and one that the technology sector can play a major role in addressing.'

But the crux of the problem remains: according to a report from Credit Suisse, annual world water use has risen sixfold during the past century, more than double the rate of population growth. By 2025, almost two-thirds of the global population will live in countries where water will be a scarce commodity. And that could lead to conflict, as United Nations secretary-general Ban Ki-moon warned last week.

Asia looks vulnerable, with China planning to syphon off Tibet's water supply to make up for shortages in the parched north. Elsewhere, the Israel-Palestine conflict is at least partly about securing supplies from the River Jordan; similarly, water is a major feature of the strife in Sudan that has left Darfur devastated. When it comes to this most basic of commodities, the stakes could hardly be higher.

Source: Richard Wachman, Observer, 9 December 2007

seep into the groundwater supply; nearly 25 per cent of groundwater in Europe shows levels of contamination higher than that deemed permissible by the European Union (UNDP 1998). Some of the most polluted

water can be found near former industrial areas, where traces of mercury, lead and other metals have lodged in the sediments and continue slowly to emit pollutants into the water supply over a period of years.