

# 1.1

## Environmental value systems

### Significant ideas

Historical events, among other influences, affect the development of environmental values systems and environmental movements.

There is a wide spectrum of environmental value systems each with their own premises and implications.

### Big questions

As you read this section, consider the following big questions:

- What value systems can you identify at play in the causes and approaches to resolving the issues addressed in this topic?
- How does your own value system compare with others you have encountered in the context of issues raised in this topic?

### Knowledge and understanding

- Significant historical influences on the development of the environmental movement have come from literature, the media, major environmental disasters, international agreements, and technological developments.
- An environmental value system (EVS) is a world view or paradigm that shapes the way an individual or group of people perceive and evaluate environmental issues. This will be influenced by cultural, religious, economic, and socio-political context.
- An EVS might be considered as a 'system' in the sense that it may be influenced by education, experience, culture, and media (inputs) and involves a set of interrelated premises, values, and arguments that can generate consistent decisions and evaluations (outputs).
- There is a spectrum of EVSs from ecocentric through anthropocentric to technocentric value systems.
- An ecocentric viewpoint integrates social, spiritual, and environmental dimensions into a holistic ideal. It puts ecology and nature as central to humanity, and emphasizes a less materialistic approach to life with greater self-sufficiency of societies. An ecocentric viewpoint prioritizes biorights, emphasizes the importance of education, and encourages self-restraint in human behaviour.
- An anthropocentric viewpoint believes humans must sustainably manage the global system. This might be through the use of taxes, environmental regulation, and legislation. Debate is encouraged to reach a consensual, pragmatic approach to solving environmental problems.
- A technocentric viewpoint believes that technological developments can provide solutions to environmental problems. This is a consequence of a largely optimistic view of the role humans can play in improving the lot of humanity. Scientific research is encouraged in order to form policies and understand how systems can be controlled, manipulated, or changed to solve resource depletion. A pro-growth agenda is deemed necessary for society's improvement.
- There are extremes at either end of this spectrum – for example, deep ecologists (ecocentric) and cornucopian (technocentric). However, in practice, EVSs vary greatly with culture and time, and rarely fit simply or perfectly into any classification.
- Different EVSs ascribe different intrinsic values to components of the biosphere.

Opposite: Argentina's Perito Moreno glacier, in the Patagonian province of Santa Cruz. Glaciers have historically been in equilibrium with their environment, although the increased melt of certain ice fields suggests that the planet may be heading for a tipping point where higher temperatures are the norm.

## What is ESS?

The title of this course has three components – ‘environment’, ‘systems’, and ‘societies’. The **environment** of an animal or plant can be defined as the external surroundings that act on it and affect its survival – our environment extends from our immediate surroundings to ultimately, at its greatest extent, the whole Earth. A **system** is something that is made from separate parts that are linked together and affect each other. A **society** is a group of individuals who share some common characteristic such as geographical location, cultural background, historical timeframe, religious perspective, or value system. ESS can best be appreciated when each of these components are viewed holistically, that is to say, as a whole.

## The development of the environmental movement

Few photos can have had a greater impact than the one taken by NASA’s Apollo 8 mission on 24 December 1968. Before this image, the Earth had seemed vast with almost limitless resources. But once people saw Earth suspended in space, with the moon much larger in the foreground, they gained an appreciation of the vulnerability of the planet and its uniqueness in the Solar System and the universe beyond. Some think that this photo was the beginning of the **environmental movement** – the worldwide campaign to raise awareness, and coordinate action, to tackle the negative effects that humans are having on the planet. But although the image was pivotal in helping to highlight environmental issues, the environmental movement existed before this milestone photograph.



Earthrise from the Moon.  
This photograph was taken during the Apollo 8 mission of 21–27 December 1968.

Significant historical influences on the development of the environmental movement have come from major environmental disasters, literature, the media, international agreements, and technological developments.



The environmental movement advocates sustainable development through changes in public policy and individual behaviour. The modern movement owes much to developments in the latter part of the 20th century, although its history stretches back for as long as humans have been faced with environmental issues. Some significant moments in the environmental movement are outlined below.

### Environmental disasters

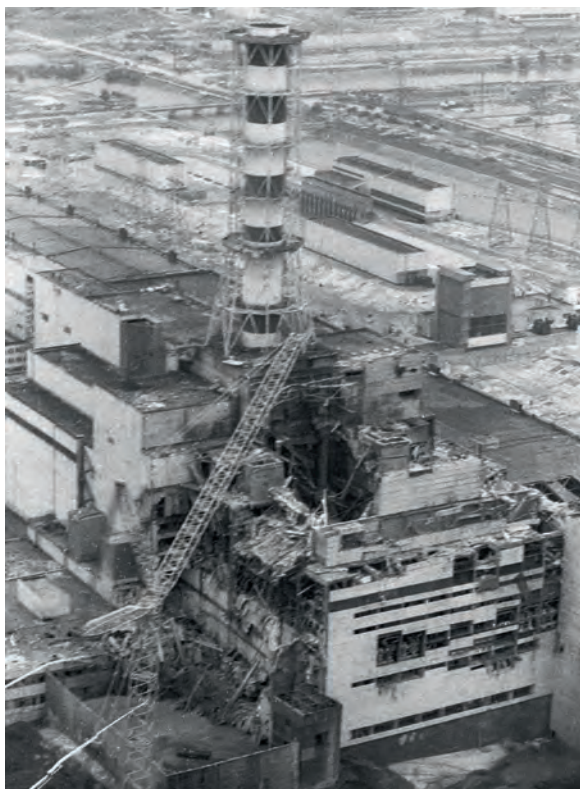
- In 1956, a new disease was discovered in Minamata City in Japan. It was named Minamata disease and was found to be linked to the release of methyl mercury into the waste water produced by the Chisso Corporation’s chemical factory. The

mercury accumulated in shellfish and fish along the coast. The contaminated fish and shellfish were eaten by the local population and caused mercury poisoning. The symptoms were neurological – numbness of the hands, damage to hearing, speech, and vision, and muscle weakness. In extreme cases, Minamata disease led to insanity, paralysis, and death. The pollution also led to birth defects in newborn children.

- At midnight on 3 December 1984, the Union Carbide **pesticide** plant in the Indian city of Bhopal released 42 tonnes of toxic methyl isocyanate gas. This happened because one of the tanks involved with processing the gas had overheated and burst. Some 500 000 people were exposed to the gas. It has been estimated that between 8000 and 10 000 people died within the first 72 hours following the exposure, and that up to 25 000 have died since from gas-related disease.
- On 26 April 1986, early in the morning, reactor number four at the Chernobyl plant in the Ukraine (then part of the Soviet Union) exploded. A plume of highly radioactive dust (fallout) was sent into the atmosphere and fell over an extensive area. Large areas of the Ukraine, Belarus, and Russia were badly contaminated. The disaster resulted in the evacuation and resettlement of over 336 000 people. The fallout caused increased incidence of cancers in the most exposed areas. An area immediately surrounding the plant, covering approximately 2600 km<sup>2</sup>, still remains under exclusion due to radiation. The incident raised issues concerning the safety of Soviet nuclear power stations in particular, but also the general safety of nuclear power. These worries remain to this day.
- For many years, the Chernobyl disaster was the only major nuclear incident. That changed on 11 March 2011 when an earthquake in northern Japan caused a tsunami that hit the coastal Fukushima nuclear power plant, causing a meltdown in three of the six nuclear reactors. The damage resulted in radioactive material



▲ Minamata disease caused severe birth defects, ranging from malformed limbs to complete paralysis.



▲ The Bhopal disaster made headlines around the world. Despite protests, little has been done for families of the victims.

◀ Damage to the Chernobyl nuclear reactor



escaping into the sea. Following the incident, all 48 of the country's reactors were closed so that new safety checks could be done, leading to an increased dependence on fossil fuels: before Fukushima, nuclear had provided 30 per cent of Japan's energy needs. The move away from nuclear power was replicated around the world. Germany, in particular, backtracked on its nuclear ambitions, even though the disaster at Fukushima was caused by specific local issues (the coastal location of the plant, and the inadequacy of defences for extreme tidal events such as tsunamis).

▲  
Satellite image of the Fukushima Dai-ichi nuclear power plant in Okuma, Japan, taken after the 2011 earthquake and tsunami.

## Literature



▲  
A selection of books on environmental issues, including some that have influenced the Green movement

- In 1962, American biologist Rachel Carson's influential book *Silent Spring* was published. It remains one of the most influential books of the environmental movement. The case against chemical pollution was strongly made as Carson documented the harmful effects of pesticides along **food chains** to top predators. The book led to widespread concerns about the use of pesticides and the pollution of the environment.
- Many other significant publications have contributed to the environmental movement. In 1972, the Club of Rome – a global think tank of academics, civil servants, diplomats, and industrialists that first met in Rome – published *The Limits to Growth*. This report examined the consequences of a rapidly growing world population on finite natural resources. It has sold 30 million copies in more than 30 translations and has become the best-selling environmental book in history.
- James Lovelock's book *Gaia* (1979) proposed the hypothesis that the Earth is a living organism, with self-regulatory mechanisms that maintain climatic and biological conditions. He saw the actions of humanity upsetting this balance with potentially catastrophic outcomes. Subsequent books, up to the present day, have developed these ideas.



▲  
Rachel Carson, a well-known biologist, wrote many popular natural history magazine articles and books.

## Media

Protests about environmental disasters and concern about the unsustainable use of the Earth's resources have led to the formation of pressure groups, both local and international. All these groups have at their centre the concept of stewardship. This

is the belief that every person has a responsibility to look after the planet, for themselves and for future generations, through wise management of natural resources. Such groups have resulted in increased media coverage that has raised public awareness about these issues. One of the most influential of these groups is Greenpeace, founded in the early 1970s, and which made its name in 1975 by mounting an anti-whaling campaign. The campaign actively confronted Soviet whalers in the Pacific Ocean off the Californian coast, and eventually developed into the 'Save the Whale' campaign, which made news headlines around the world and became the blueprint for future environmental campaigns. In the 1980s, Greenpeace made even bigger headlines with its anti-nuclear testing campaign.

- In 2006, the film *An Inconvenient Truth* examined the issues surrounding climate change, and increased awareness of environmental concerns. The publicity surrounding the film meant that more people than ever before heard about global warming, and its message was spread widely and rapidly through modern media, such as the internet. The film made the arguments about global warming very accessible to a wider audience, and raised the profile of the environmental movement worldwide. The film was supported by a book that recorded hard scientific evidence to support its claims.



- Earth Day is marked each year on 22 April, coordinated globally via the internet and other media. It was founded in 1970 by a US Senator from Wisconsin, Gaylord Nelson, after he had seen the effects of a massive oil spill in Santa Barbara, California, in 1969. By creating a day that celebrated the Earth, he saw a way of moving environmental protection more centrally onto the national political agenda. Earth Day is celebrated simultaneously around the world, encouraging people to participate in environmental campaigns both local and global.

## International agreements

- In 1972, the United Nations held its first major conference on international environmental issues in Stockholm, Sweden – the UN Conference on the Human Environment, also known as the Stockholm Conference. It examined how human activity was affecting the global environment. Countries needed to think about how



The sinking of Greenpeace's flagship *Rainbow Warrior* in the port of Auckland, New Zealand, in July 1985, raised an international protest. The sinking was coordinated by French intelligence services to prevent the ship interfering with nuclear tests in the Polynesian island of Moruroa. For France, it was a public relations disaster that did much to promote Greenpeace's environmental campaign against nuclear testing.

*An Inconvenient Truth*, a documentary of Al Gore (former US Vice President) giving a lecture on climate change, marked a significant change in public opinion in the USA. It was the first time a mainstream political figure had championed environmental issues.



To learn more about Earth Day, go to [www.pearsonhotlinks.co.uk](http://www.pearsonhotlinks.co.uk), enter the book title or ISBN, and click on weblink 1.1.



United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, 3–14 June 1992.

they could improve the living standards of their people without adding to pollution, habitat destruction and species extinction. The conference led to the Stockholm Declaration, which played a pivotal role in setting targets and shaping action at both an international and local level. These early initiatives ultimately led to the Rio Earth Summit in 1992, coordinated by the United Nations, which produced **Agenda 21** and the Rio Declaration. The Stockholm Declaration and subsequent global summits have played a leading role in shaping attitudes to sustainability.

- In 1987, a report by the UN World Commission on Environment and Development (WCED) was published, intended as a follow-up to the Stockholm Conference. The report was called *Our*

*Common Future*; it took the ideas from Stockholm and developed them further. It linked environmental concerns to development and sought to promote sustainable development through international collaboration. It also placed environmental issues firmly on the political agenda. *Our Common Future* is also known as the Brundtland Report after the Chair of the WCED, former Norwegian Prime Minister, Gro Harlem Brundtland.

- The publication of *Our Common Future* and the work of the WCED provided the groundwork for the UN's Earth Summit in Rio in 1992. The conference was unprecedentedly large for a UN conference. It was attended by 172 nations: the wide uptake and international focus meant that its impact was likely to be felt across the world. The summit's radical message was that nothing less than a transformation of our attitudes and behaviour towards environmental issues would bring about the necessary changes. The conference led to the adoption of Agenda 21: a blueprint for action to achieve sustainable development worldwide (21 refers to the 21st century). Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the UN, governments, and environmental groups in every area in which humans affect the environment. It was adopted by more than 178 governments at the Earth Summit.

The Earth Summit changed attitudes to sustainability on a global scale, and changed the way in which people perceived economic growth (i.e. that sometimes this is at the expense of the environment and not necessarily a good thing). It encouraged people to think of the indirect values of ecosystems (e.g. ecosystem services, pages 42–43) rather than the purely economic ones. It also was important for emphasizing the relationships between human rights, population, social development, women, and human settlements, and the need for environmentally sustainable development. Its emphasis was on change in attitude affecting all economic activities, ensuring that its impact could be extensive. The conference meant that environmental issues came to be seen as mainstream rather than the preserve of a few environmental activists. Particular achievements were steps towards preserving the world's **biodiversity** (through the Convention on Biological Diversity, CBD) and steps to address the **enhanced greenhouse effect** (via the UN Framework Convention on Climate Change, UNFCCC), which in turn led to the Kyoto Protocol.

Both the CBD and UNFCCC are legally binding conventions, and both are governed by the Conference of the Parties (COP) which meet either annually or biennially to

Acronyms are formed from the first letter or first few letters of each word in a phrase or title (e.g. CBD, UNFCCC, COP). Using such shortened forms can speed up communication. International conventions widely use acronyms.



assess the success and future directions of the Convention. For example, COP 11 of the CBD took place in Pyeongchang, Republic of Korea, in October 2014; COP 15 of the UNFCCC took place in Copenhagen, Denmark, in December 2009; and COP 20 of the UNFCCC took place in Lima, Peru, in December 2014. The Copenhagen Accord was a document produced at COP 15 of the UNFCCC, in which attending parties were asked to ‘take note’ of the concerns raised at the meeting about climate change – the document was not legally binding.

### CONCEPTS: Biodiversity

Biodiversity is a broad concept encompassing the total variety of living systems.

Some national and state governments have legislated or advised that local authorities take steps to implement Agenda 21. Known as ‘Local Agenda 21’ (LA21), these strategies apply the philosophy of the Earth Summit at the local level. Each country is urged to develop an LA21 policy, with the agenda set by the community itself rather than by central or local government, as ownership and involvement of any initiatives by society at large is most likely to be successful.

- The 1992 Earth Summit was followed up 10 years later by the Johannesburg World Summit on Sustainable Development (Figure 1.1). The Johannesburg meeting looked mainly at social issues, and targets were set to reduce poverty and increase people’s access to safe drinking water and sanitation (problems that cause death and disease in many **less economically developed countries (LEDCs)**).
- In 2012, the UN Conference on Sustainable Development (UN CSD, or Rio+20) took place to commemorate the 20th anniversary of the Earth Summit. The meeting had three main objectives:
  - to secure political commitment from nations to sustainable development
  - to assess progress towards internationally agreed commitments (e.g. CO<sub>2</sub> reductions)
  - to examine new and emerging challenges.

Issues focused on two themes:

- economic development in the context of sustainable development (i.e. the encouragement of ‘green economies’) with an emphasis on poverty eradication
- how institutional frameworks can be developed on a more sustainable basis.

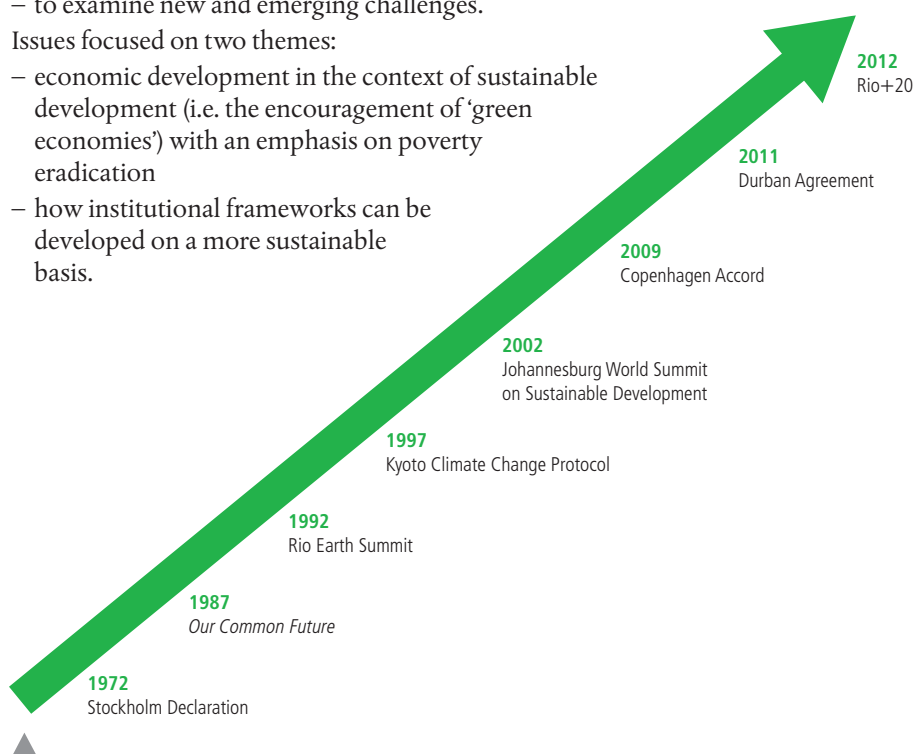


Figure 1.1 Important milestones in the environmental movement

Major landmarks in the modern environmental movement include:

Minamata, Rachel Carson's *Silent Spring*, the Save the Whale campaign, Bhopal, and the Chernobyl disaster. These led to:

- environmental pressure groups, both local and global
- the concept of stewardship
- increased media coverage raising public awareness.

You need to cover a variety of significant historical influences that affected the environmental movement, and be able to recall a minimum of three in-depth examples in exams. It is a good idea to select a range of historical influences that includes both local and global examples.



Rio+20 again brought governments, international institutions, and major groups together to agree on a range of measures to reduce poverty while promoting good jobs, clean energy, and a more sustainable and fair use of resources.

- The effect of climate change, both in terms of sustainable development and its effect on the planet in general, was discussed at a UN conference in Kyoto in 1997. Agreements were made to reduce emissions of **greenhouse gases**, and gave participant **more economically developed countries (MEDCs)** legally binding targets for cuts in emissions from the 1990 level. The Kyoto Protocol stipulated that these targets should be reached by the year 2012. The meetings that followed the UNFCCC meeting at Copenhagen in 2009 worked towards finding a successor to the Kyoto Protocol.
- At the 2011 Durban conference (South Africa), the debate about a legally binding global agreement was reopened: countries were given until 2015 to decide how far and how fast to cut their carbon emissions. Before the Durban conference, most countries were going to follow national targets for carbon emissions after 2012, which would be voluntary and not legally binding. The Durban Agreement differs from the Kyoto Protocol in that it includes both MEDCs and LEDCs rather than just MEDCs, and also differs from other summits in that it is working towards a legally binding treaty.

It is true that countries can break these agreements and there is little the international community can do about this. Moreover, summits may not achieve their initial goals, but they do act as important catalysts in changing the attitudes of governments, organizations and individuals.

## Technological innovation

The **Green Revolution** refers to a time between the 1940s and the late 1960s when developments in scientific research and technology in farming led to increased agricultural productivity worldwide. The Club of Rome (page 6) claimed in their *The Limits to Growth* report that, within a century, a mixture of human-made pollution and resource depletion would cause widespread population decline. But the intervention of the Green Revolution meant that by 2000, world population had reached 6 billion, and is predicted to rise to nearly 9 billion by 2050. The intensification of agriculture raised many questions for the environmental movement (pages 280–282), as has the increase in human population (pages 404–405).

Other technological innovations have created alternatives to fossil fuel use (e.g. solar panels and wind turbines) which make the arguments proposed by environmentalists (i.e. a switch to more sustainable sources of energy) a real possibility, and drive the environmental movement forward still further.

### CONCEPTS: Environmental value systems

Environmental disasters have affected the way people view human impacts on the planet. Realization of the negative influences people have had has led to the development of the environmental movement, which in turn has affected the views of people around the globe.



Popular books such as *Silent Spring*, and films such as Al Gore's *An Inconvenient Truth*, can provide knowledge about environmental issues on a global scale. People who previously had limited understanding of the environment are enabled to make their own minds up about global issues. But do they have enough information to see all sides of the argument? A good education would certainly put these arguments in a wider context. Is it a problem that many people receive only one side of the argument?



## Environmental value systems

An **environmental value system (EVS)** is a particular worldview or set of **paradigms** that shapes the way an individual, or group of people, perceive and evaluate environmental issues. A person's or group's EVS is shaped and influenced by cultural factors (including religion), economic (e.g. whether from a LEDC or MEDC), and socio-political context (e.g. democratic or authoritarian society).

### SYSTEMS APPROACH

An EVS might be considered as a system in the sense that it may be influenced by education, experience, culture, and media (inputs), and involves a set of interrelated assumptions, values, and arguments that can generate consistent decisions and evaluations (outputs).

The systems approach is explained in detail on pages 19–22. EVSs, like all systems, are assemblages of parts and the relationships between them, which together constitute a whole. Systems have inputs, outputs (which are determined by the processing of inputs), and storages. The outputs generate consistent decisions and evaluations.

EVS inputs are:

- education
- cultural influences
- economic factors
- socio-political factors (the interaction of social and political factors; for example, communism, capitalism)
- religious texts and doctrine
- the media.

EVS outputs are:

- perspectives
- decisions on how to act regarding environmental issues
- courses of action.

Flows of information into individuals within societies are processed or transformed into changed perceptions of the environment and altered decisions about how best to act on environmental matters. At their strongest, such information flows cause people to take direct action to alleviate environmental concerns. It is possible that inputs transfer through the individual or group without processing, but it is unlikely that an input has no effect at all.

EVSs act within social systems. Social systems are more general than **ecosystems**. There are lots of different types of social system: class-based; democratic or authoritarian; patriarchal (male dominance) or matriarchal (female dominance); religion-based; industrial (technology-based) or agrarian (agriculture-based); capitalist or communist. Rather than the flows of energy and matter we see in ecosystems (Chapter 2, pages 87–100), social systems have flows of information, ideas and people. Both ecosystems and social systems exist at different scales, and have common features such as feedback and equilibrium (pages 30–32). Trophic levels exist in ecosystems while in social systems there are social levels within society, and both contain consumers and producers. Producers in social systems are responsible for new input (e.g. ideas, films, books, documentaries) and consumers absorb and process this information.

An environmental value system (EVS) is a worldview or paradigm that shapes the way an individual or group of people perceive and evaluate environmental issues. It is influenced by the cultural, religious, economic and socio-political context.

A society is a group of individuals who share some common characteristics, such as geographical location, cultural background, historical timeframe, religious perspective, value system, and so on.

Buddhist monks are frequently active in a range of campaigns including forest conservation in Thailand.



The development of environmental value systems is influenced by differences in culture and society. Buddhist societies, for example, see the human being as an intrinsic part of nature. A society's EVS influences the actions taken by its citizens in response to environmental issues. Buddhist monks in Thailand, for example, are part of a growing environmental movement.

They are involved in ecological conservation projects, and teach ecologically sound practices among Thai farmers. Unsustainable development based on rapid economic development is seen to be one of the primary causes of Thailand's environmental crisis. The respect in which Buddhist monks are held means that their views are listened to and can have a profound effect on the population.

There is a range of EVSs, from ecocentric to technocentric.



Norwegian philosopher Arne Næss pioneered and first named the ecocentric EVS known as deep ecology.

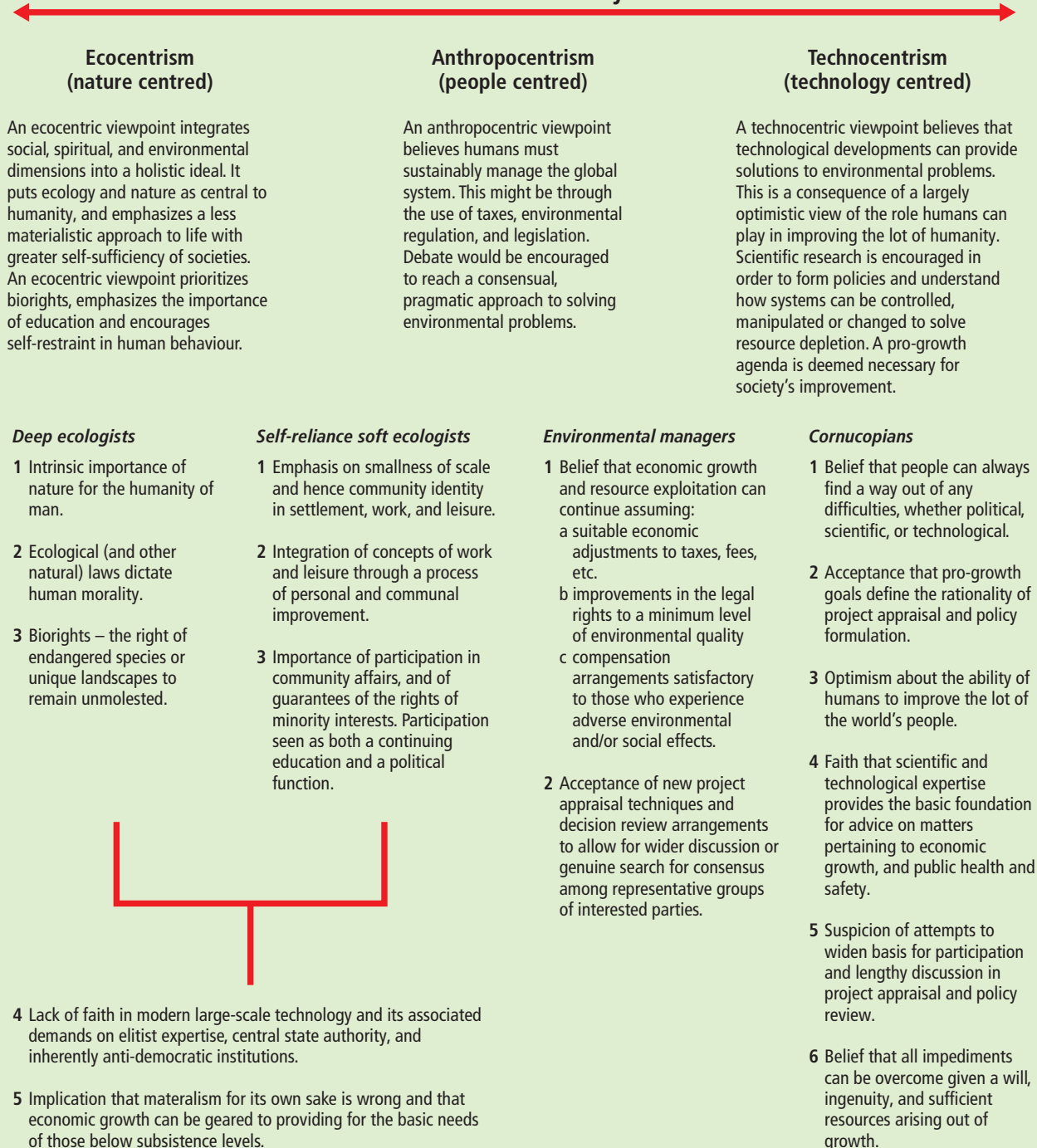
## The range of EVSs

EVSs can broadly be divided into **technocentric** and **ecocentric** with **anthropocentric** between the two (Figure 1.2). Technocentrists believe that technology will keep pace with and provide solutions to environmental problems. Ecocentrists are nature-centred and distrust modern large-scale technology; they prefer to work with natural environmental systems to solve problems, and to do this before problems get out of control. The anthropocentrists include both technocentric and ecocentric viewpoints. An anthropocentrist believes humans must sustainably manage the global system: this might be through taxes, environmental regulation, and legislation. Debate is encouraged so that a consensual, pragmatic approach to solving environmental problems can be reached.

The technocentrist approach is sometimes termed a **cornucopian** view: a belief in the unending resourcefulness of humans and their ability to control their environment. This leads to an optimistic view about the state of the world. Ecocentrists, in contrast, see themselves as subject to nature rather than in control of it. Ecocentrists see a world with limited resources where growth needs to be controlled so that only beneficial growth occurs. At one end of the ecocentrist worldview are the self-reliance soft ecologists – those who reject materialism and have a conservative view regarding environmental problem-solving. At the other end are the **deep ecologists** – those who put more value on nature than humanity.

Although there are extremes at either end of this range (i.e. deep ecologists at the ecocentric end of the spectrum and cornucopians at the technocentric end), in practice, EVSs vary greatly with culture and time and rarely fit simply or perfectly into any classification.

## Environmental Value System



'The pattern of environmentalist ideologies', adapted from *Environmentalism, 2nd edition* by Timothy O'Riordan, Figure 10.1, page 376, copyright © 1981, Pion Ltd

**Figure 1.2** The range of environmental value systems

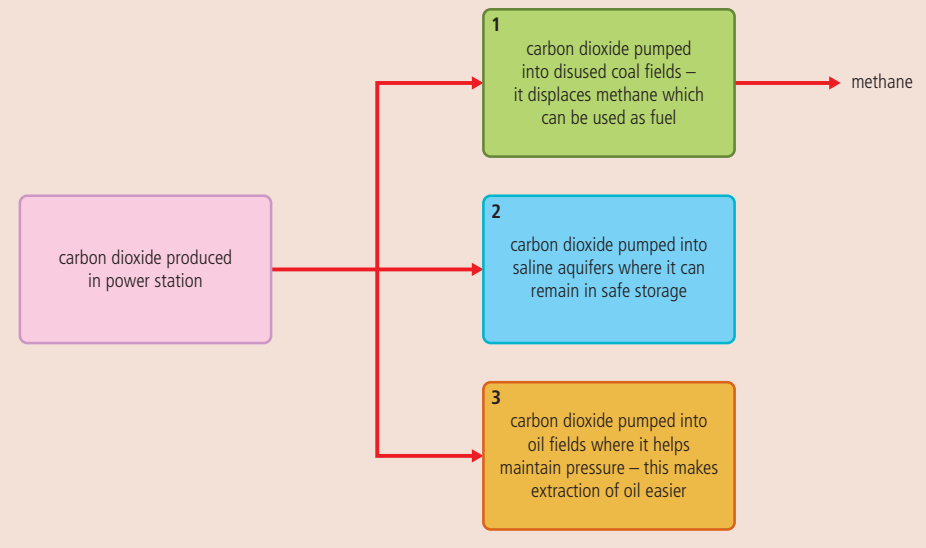
Figure 1.3 Options for carbon capture and storage

**Intrinsic value means that something has value in its own right, i.e. inbuilt/inherent worth.**

### Case study

#### A technocentrist approach to reducing carbon dioxide emissions

Energy and gasoline companies have been developing technological solutions to carbon dioxide emissions in order to alleviate global warming. Carbon-capture-and-storage (CCS) techniques involve taking the carbon dioxide produced from industrial processes and storing it in various ways (Figure 1.3). This means it is not released into the atmosphere and does not contribute to global warming. A BP project at In Salah in Algeria aims to store 17 million tonnes of carbon dioxide – an emission reduction equivalent to removing 4 million cars from the road. Such projects have yet to be made available on a large-scale commercial basis because of the costs involved.



### CONCEPTS: Environmental value systems

Discuss with your neighbour in class how the environment can have its own intrinsic value. Think of some specific examples and talk about these. Do you have the same view of what these intrinsic values are? Feedback to the rest of the class and discover how many different viewpoints there are.

Ecosystems may often cross national boundaries and conflict may arise from the clash of different value systems about exploitation of resources (for example, migration of wildlife across borders in southern Africa). This is discussed in Chapter 2.

## Contrasting EVSs

Different types of society have different environmental perspectives, based on their individual EVSs. Two case studies examine two pairs of contrasting societies.

### Case study

#### Judaeo-Christian and Buddhist societies

The view of the environment in Judaeo-Christian religions is one of stewardship, where humans have a role of responsibility towards the Earth. The Genesis story suggests that God gave the planet to humans as a gift. Other biblical stories indicate that humanity should make the most of this gift as stewards.

An example of such a story is the parable of the talents told by Jesus. A rich employer sets off on a journey. He leaves his money in the care of his three employees. On his return, he calls his employees together to give an account of their activities in his absence.

- The first employee invested the money, and increased it 10 times.
- The second also invested the money, and managed to increase it five times.
- The third, fearing his employer's reaction if he lost the money, buried it.

The employer fires the third man, and praises the other two for being good stewards and making something of the monies they were responsible for.

This contrasts with the Buddhist approach to the environment, which sees the human being as an intrinsic part of nature, rather than a steward. Buddhism is sometimes seen as an ecological philosophy (because of its worldview rather than anything that appears in its writings, which are not explicitly environmental). Buddhism emphasizes human interrelationships with all other parts of nature, and supports the belief that to think of ourselves as isolated from the rest of nature is unrealistic. The Buddhist approach can be summarized as:

- compassion is the basis for a balanced view of the whole world and of the environment
- a 'save and not waste' approach means that nothing in nature is spoiled or wasted; wanton destruction upsets the vital balance of life
- ecology is rebuilt through the philosophy 'uplift of all', which is based on people acting compassionately and working together **altruistically**.

Vegetarianism is part of the Buddhist tradition; it is a reflection of Buddhist respect for all life. Reincarnation, the belief that human consciousness (or spirit) is immortal and can be reborn after death in either human or animal form, also emphasizes humanity's interconnectedness with nature. Buddhists believe that nothing has a fixed and independent existence; all things are without self-existence and are impermanent. From this perspective, humans are intimately related to their environment and cannot exist separately from the rest of the world. Recognizing this principle of interdependence inspires an attitude of humility and responsibility towards the environment.

## Case study

### Native Americans and European pioneers

Prior to the colonization of North America by Europeans from the late 16th century onward, the country was occupied solely by native American Indian tribes. Native Americans, in general, saw their environment as communal, and had a subsistence economy based on barter. Their low-impact technologies meant that they lived in harmony with the environment – something supported by their animistic religion where all things have a soul – animals, plants, rocks, mountains, rivers, and stars.

The incoming European pioneers operated frontier economics, which involved the exploitation of what they saw as seemingly unlimited resources. This inevitably led to environmental degradation through over-population, lack of connectivity with the environment, heavy and technologically advanced industry, and unchecked exploitation of natural resources.

## TOK

Different societies have different environmental perspectives, based on individual EVSs. Individual and societal understanding and interpretation of data regarding environmental issues is influenced by these perspectives. Can there be such a thing as an unbiased view of the environment? Can we ever expect to establish a balanced view of global environmental issues?

## Decision-making and EVSs

EVSs influence our decision-making processes. Let's consider the contrasting perspectives of ecocentrism and technocentrism in relation to three specific cases.

### Environmental challenges posed by the extensive use of fossil fuels

Fossil fuels have problems associated with their use (i.e. **global warming**). The cornucopian belief in the resourcefulness of humans and their ability to control their environment would lead to a technocentric solution, where science is used to find a useful alternative (e.g. hydrogen fuel cells). As technocentrists, cornucopians would see this as a good example of resource replacement: an environmentally damaging industry can be replaced by an alternative one. Rather than seeing it as necessary to change their lifestyles to reduce the use of fuel, cornucopians would look to develop technology to reduce the output of carbon dioxide from fuel use. A cornucopian would say that economic systems have a vested interest in being efficient so the existing problems will self-correct given enough time, and that development (which requires energy) will increase standards of living thus increasing demands for a healthy environment. Scientific efforts should be devoted to removing carbon dioxide from the atmosphere, and reducing its release, rather than curtailing economic growth.



You need to be able to evaluate the implications of two contrasting environmental value systems in the context of given environmental issues, and to be able to justify the implications using evidence and examples to make the justification clear.

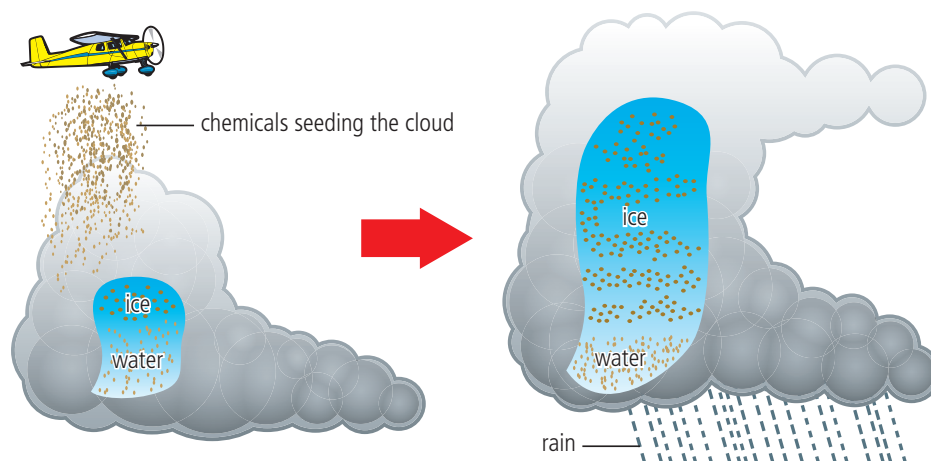
A technocentrist would predict that market pressure would eventually result in the lowering of carbon dioxide emission levels.

An ecocentrist approach to the same problem would call for the reduction of greenhouse gases through curtailing existing gas-emitting industry, even if this restricts economic growth.

### Approaches of resource managers to increasing demand for water resources

The technocentric manager would suggest that future needs can be met by technology, innovation and the ability to use untapped reserves. They would support such measures as removal of fresh water from seawater (desalination) if they were near an ocean, iceberg capture and transport, wastewater purification, synthetic water production (water made through chemical reactions, or hydrogen fuel cell technology), cloud seeding (Figure 1.4), and extracting water from deep aquifers. They would also look at innovative ways to reduce the use of water, both in industry and at a domestic level.

**Figure 1.4** Chemicals such as silver iodide or frozen carbon dioxide are released into clouds. They offer surfaces around which water and ice crystals form. When they are large enough, they fall out of the cloud and become rain.



The ecocentric manager would highlight the overuse and misuse of water. They would encourage the conservation of water and greater recycling, and say that water use should be within sustainable levels. Monitoring would be recommended to ensure that water use remained within sustainable limits. An ecocentrist would encourage water use that had few detrimental impacts on habitat, wildlife, and the environment.

### Methods for reducing acid rain

**Acid rain** is produced when sulfur dioxide, produced by burning fossil fuels such as coal, dissolves in atmospheric water, ultimately falling as rain (see page 341). The ecocentrist would argue for a change in lifestyle that reduces the need for either the energy produced by coal, or the products that are made with that energy. For example, a reduction of heat in the home could be achieved by dressing more warmly instead of raising the indoor temperature. Changes in transport use would reduce reliance on fossil fuels, and could be achieved by walking or bicycling to work or when doing the shopping. Reducing the use of cars would reduce the release of acid deposition precursors. Ecocentrists would also encourage the 'reuse, reduce, recycle' philosophy (Figure 1.5; Chapter 8, pages 435–436). Central to their worldview would be the idea that life should cherish spiritual well-being, rather than the satisfaction of material desires. This would reduce desires for continuously purchasing consumer goods.



**REDUCE  
REUSE  
RECYCLE**

**Figure 1.5** The 'Reduce, Reuse, Recycle' campaign encourages people to care for goods (making them last as opposed to frequently replacing them with new ones), reduce consumption, and recycle waste.

Technocentrists would again argue for use of alternative technology and encouraging continued economic growth irrespective of the effect of greenhouse gas emissions because they see humanity as able to control the problem as and when necessary.

## Intrinsic value

Different EVSs view the different components of the **biosphere** (the living part of the Earth) in very different ways, and attribute to them different values. For example, indigenous farmers using shifting cultivation in the Amazonian rainforest in Brazil would see the rainforest as a natural resource that should be used in a way that minimizes human impact on the environment (i.e. an ecocentrist EVS), whereas city-dwellers in Brasilia (federal capital of Brazil) are more likely to see the rainforest as a resource to be exploited for economic gain, and underestimate the true value of pristine rainforest (i.e. a technocentrist EVS). Intrinsic values may also vary between different EVSs (case studies, pages 14–15). An intrinsic value is one that has an inherent worth, irrespective of economic considerations (Chapter 8, pages 418–419), such as the belief that all life on Earth has a right to exist. For example, a visitor to a friend's garden in the summer may value the abundance of insect life not seen in their city home, whereas the owner appreciates the services provided by the insects in sustaining the garden, such as woodlice that recycle fallen leaves and bees that pollinate the flowers. Intrinsic values include values based on cultural, aesthetic, and bequest significance (i.e. of value to children and grandchildren).

### CONCEPTS: Environmental value systems

EVSs determine the decision-making processes regarding environmental issues, such as choice of energy usage, reaction to limited natural resources such as water, responses to pollution, and attitudes towards ecological deficit. The ESS course helps you to appreciate and evaluate your own EVS. Such an understanding will enable you to appreciate how worldviews influence the way in which you perceive and act regarding environmental issues. During this course, you will be encouraged to develop your own EVS and justify your decisions on environmental issues based on this EVS. This is a personal thing: EVSs are individual and there are no 'wrong' EVSs, but you should be able to justify your viewpoint.

### Exercises

1. Draw a timeline from the 1950s to the present day to summarize development of the modern environmental movement.
2. What is meant by an environmental value system? List three inputs and three outputs of these systems.
3. Environmental value systems range between *ecocentric* and *technocentric* perspectives. What do these terms mean?
4. Summarize the differences between ecocentric and technocentric philosophies with regard to the following issues:
  - a. environmental challenges posed by fossil fuels
  - b. the response of resource managers to increasing demands for water
  - c. methods for reducing acid rain.

### Big questions

Having read this section, you can now discuss the following big questions:

- What value systems can you identify at play in the causes and approaches to resolving the issues addressed in this topic?
- How does your own value system compare with others you have encountered in the context of issues raised in this topic?

## CHALLENGE YOURSELF

### Thinking skills **ATL**

Create a table that summarizes the ecocentric and technocentric approaches to each of the three case studies discussed above. The table will help you compare and evaluate the response of managers with contrasting EVSs to different environmental issues.

**Different EVSs ascribe different intrinsic values to components of the biosphere.**

You need to be able to discuss the view that the environment can have its own intrinsic value.

**TOK**

There are assumptions, values and beliefs, and worldviews that affect the way in which we view the world. These are influenced by the way we are raised by our parents, by education, by our friends and by the society we live in.