

Environmental Ethics

Learning Outcomes

After reading this chapter, you should be able to:

- Understand current environmental challenges, including pollution, climate change, and wilderness preservation.
- Explain the difference between anthropocentric and ecocentric or biocentric ideas about environmental ethics.
- Clarify the difference between intrinsic value and instrumental value.
- Explain how cost-benefit analysis applies in thinking about environmental issues.
- Understand the idea of environmental justice.
- Explain the idea of Leopold's "land ethic."
- Outline basic differences between ecofeminism and deep ecology.
- Defend a thesis with regard to environmental issues and the value of nonhuman nature.

On May 31, 2013, the widest tornado ever recorded on the planet (measuring 2.6 miles across) tore a 16.2-mile path across Oklahoma near El Reno, outside of Oklahoma City. Wind speeds reached 295 miles per hour, and the storm was rated an EF-5, the highest possible rating on the Enhanced Fujita scale. Eighteen people were killed.¹ This storm came barely a week after another EF-5 tornado hit Oklahoma, striking Moore and its surrounding areas, flattening entire neighborhoods and killing twenty-four. Oklahoma is in the area of the United States known as "Tornado Alley," where tornadoes most frequently occur. But even in this tornado-prone area, two EF-5s back-to-back was unusual. In addition to record-strength tornadoes, the United States has also been hit with especially damaging hurricanes in recent years. In 2005, Hurricane Katrina killed more than 1,800 people and caused massive damage along the coast of the Gulf of Mexico. It was the most expensive storm in U.S. history, with devastating destruction of infrastructure as well as long-term damage to jobs and the economy. In 2012, Hurricane Sandy hit the East Coast, killing 285 people and causing billions of dollars of damage; it was the country's second most expensive storm in history.

Some worry that storms such as these are warning signs, harbingers of our changing climate. Others dispute the idea that climate change could be blamed for particular tornadoes or hurricanes. But behind that dispute is the fact that natural disasters can quickly destroy lives. And this points toward the question of the value of nature and our place within it. Is the natural world something to be revered and cherished? Or is Mother Nature to be feared and dominated? And what sort of impact should human beings have on the environment?

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These sorts of questions must be confronted as the human population continues to expand. Earth's human population is currently above seven billion. The human population is expected to increase by two billion—up to a population of nine billion—by 2050. At the same time, standards of living are increasing, which creates greater demand for energy, more pollution, and related environmental impacts. The Organisation for Economic Co-operation and Development concluded in a 2012 report that if we continue developing at the current pace, there will be serious and irreversible environmental impacts that could “endanger two centuries of rising living standards.” Among the issues indicated as problems in the report are climate change, loss of biodiversity, water pollution and depletion, and high urban air pollution.²

The air pollution problem is particularly severe in developing countries. Poor air quality reportedly contributed to 1.2 million premature deaths in China in 2010.³ In Beijing and other cities, the air is often so thick with smog that it is difficult to see the tops of skyscrapers. Even in the United States air pollution remains a problem. California's Central Valley has some of the worst air pollution in the country. It also has a high number of children with asthma and

other respiratory problems. Studies in the Central Valley show that air pollution rates are correlated with asthma attacks, heart attacks, and emergency room visits for pneumonia and bronchitis.⁴

We can see from just these few examples that our environment affects us greatly. Some may argue that this is not really an ethical issue, since it is not clear that we have ethical obligations to something as abstract as “the environment.” Others will argue that we do have obligations to the environment, as well as to animal species (we will discuss obligations to animals in more detail in the next chapter). Regardless, most would agree that we ought to be concerned about the negative impacts that environmental problems cause for people, especially the vulnerable poor who are often most adversely affected by pollution and by natural disasters. We may also have obligations to future generations: to leave a livable world to our children and grandchildren.

THE ENVIRONMENT AND ITS VALUE

To answer the question of whether we have moral obligations with regard to the environment, we should first define our terms. The word *environment* comes from *environs*, which means “in circuit” or “turning around in” in Old French.⁵ From this comes



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House along the Jersey Shore partially swept away by the wall of water created by Hurricane Sandy in 2012.

the common meaning of environment as surroundings; note its spatial meaning as an area. However, we have also come to use the term to refer to what goes on in that space—that is, the climate and other factors that act on living organisms or individuals inhabiting the space. We can think of the environment as a systematic collection of materials with various physical and chemical interactions. Or we can think of it in a more organic way, giving attention to the many ways in which individual life forms are interdependent in their very nature. From the latter viewpoint, we cannot even think of an individual as an isolated atomic thing because its environment is a fundamental part of itself. From this point of view, the environment stands in relation to the beings within it—not externally, but internally.

What does it mean for people to “value” the environment? Certainly, most people realize the important effects that their environment has on them. Those things that produce benefit are good or of positive value, and those that cause harm are bad or of negative value. Most of the time it is a mixture of both. Growth is generally good, and poison is bad. But where does this goodness and badness, or positive or negative value, come from? Is it there in the poison or in growth? This is a considerably difficult metaphysical and moral problem. Does a thing have value in the same sense that it has hair or weight? This does not seem to be so because a thing’s value does not seem to be something it possesses. When we value something, we have a positive response toward it. One way to explain this is to think that the value of things is a matter of our preferences or desires. But we also want to know whether we *should* prefer or desire them. Is there something about the things that we value, some attributes that they have, for example, that are the legitimate basis for our valuing them? In answering this sort of question, we should bear in mind our earlier discussions (in the first half of this book) of the objectivity of values and the relation between the facts of nature and value judgments. Is it possible to derive an “ought” with regard to the environment? Is there a natural state of affairs that we ought to value? Or are our environmental values merely tastes or preferences?

One distinction about value plays a particularly significant role in environmental ethics: that between

intrinsic and instrumental value. Things have **intrinsic value** or worth (sometimes referred to as **inherent value**) when they have value or worth in themselves. We value things that have intrinsic value for their own sake and not for what we can get or do with them. Something has **instrumental value** if it is valued because of its usefulness for some other purpose and for someone. Some environmentalists believe that trees, for example, have only instrumental and not intrinsic value. They think that trees are valuable because of their usefulness to us. Other environmentalists believe that plants and ecosystems have value in themselves.

Another term sometimes used in discussions about environmental ethics is *prima facie value*. (As we saw in our discussion of W. D. Ross’s concept of *prima facie duties* in Chapters 3 and 7, *prima facie* means “at first glance” or “at first sight.”) Something has *prima facie* value if it has the kind of value that can be overcome by other interests or values. For example, we might think that a rainforest has some sort of *prima facie* value but that if the local population needed more land on which to cultivate food, people might be justified in cutting some of the trees to make room for crops.

These considerations about the nature of value and distinctions between different kinds of value play a key role in judging ethical matters that relate to the environment. This is exemplified by two quite different perspectives in environmental ethics. One is *anthropocentrism*, and the other *ecocentrism* or *biocentrism*.

ANTHROPOCENTRISM

The terms **anthropocentrism** and **anthropocentric** refer to a human-centered perspective. A perspective is anthropocentric if it holds that humans alone have intrinsic worth or value. According to the anthropocentric perspective, things are good to the extent that they promote the interests of human beings. Thus, for example, some people believe that animals are valuable only insofar as they promote the interests of humans or are useful to us in one or more of a variety of ways. (More discussion of this is found in the following chapter on animal ethics.) For example, animals provide nutritional, medical, protective, emotional, and aesthetic benefits for us.

Those people who hold an anthropocentric view also may believe that it is bad to cause animals needless pain, but if this is necessary to ensure some important human good, then it is justified. We do obtain useful products from the natural world. For example, taxol is a drug synthesized from the bark of the Pacific yew tree and is useful in treating ovarian and breast cancers. In the most basic and general sense, nature provides us with our food, shelter, and clothing.

According to an anthropocentric perspective, the environment or nature has no value in itself. Instead, its value is measured by how it affects human beings. Wilderness areas are instrumentally valuable to us as sources of recreation and relaxation, and they provide natural resources to meet our physical needs, such as lumber for housing and fuel. Estuaries, grasslands, and ancient forests also purify our air and clean our water. Sometimes anthropocentric values conflict. For instance, we cannot both preserve old growth forests for their beauty or historical interest and yet also use them for lumber. Therefore, we need to think about the relative value of aesthetic experiences and historical appreciation as compared with cheaper housing, lumbering jobs, and the impact of lumbering on erosion, climate change, forest fire risks, and so on. Consider the value of 2,000-year-old sequoia trees. Touching one of these giants today is in some way touching the beginning of the Common Era. We can imagine all of the major events in history that have occurred in the life of this tree, and in doing so gain a greater appreciation of the reality of those events and their connection to us and the world as we experience it. How would the value of this experience compare with the value of the tree's wood on the lumber market? Cost-benefit analyses present one method for making such comparisons.

Cost-Benefit Analysis

Because many environmental issues appeal to diverse values and involve competing interests, we can use a technique known as *cost-benefit analysis* to help us think about how to approach any given environmental problem. If we have a choice between various actions or policies, then we need to assess and compare the various harms (or costs) and

benefits that each entails in order to know which is the better action or policy. Using this method, we should choose the option that has the greater net balance of *benefits* over harms (or *costs*). This is connected to utilitarian reasoning. For example, suppose we are considering whether to hold industrial polluters to stricter emissions standards. If emissions were reduced, acid rain and global warming would be curtailed—important benefits. However, this would also create increased costs for the polluting companies, their employees, and those who buy their products or use their services. We should consider whether the benefits would be worth those costs. We would also need to assess the relative costs and benefits of alternative policies designed to address the acid rain and global warming.

Involved in such analyses are two distinct elements. One is an assessment or description of these factual matters as far as they can be known. What exactly are the likely effects of doing this or that? The other is evaluation, or the establishment of relative values. In cost-benefit analyses, the value is generally defined in anthropocentric terms. But we still need to clarify which values matter most—clean air, economic development, etc. In addition, if we have a fixed amount of money or resources to expend on an environmental project, then we know that this money or these resources will not be available for projects elsewhere. Thus, every expenditure will have a certain *opportunity cost*. In being willing to pay for the environmental project, we will have some sense of its importance in comparison with other things that we will not then be able to do or have. However, if we value something else just as much or more than cleaner air or water, for example, then we will not be willing to pay for the cleaner air or water.

In making such evaluations, we may know what monetary costs will be added to a particular forest product, such as lumber, if limits on logging were enacted. However, we are less sure about how we should value the 2,000-year-old tree. How do we measure the historical appreciation or the aesthetic value of the tree (or the animals that live in the tree)? How do we measure the recreational value of the wilderness? What is beauty or the life of a tree worth? The value of these “intangibles” is difficult to measure because measuring implies that we

use a standard means of evaluation. Only if we have such a standard can we compare, say, the value of a breathtaking view to that of a dam about to be built on the site. Sometimes we use monetary valuations, even for such intangibles as human lives or life years. For example, in insurance and other contexts, people attempt to give some measure of the value of a life.⁶ Doing so is sometimes necessary, but it is obviously also problematic.

Environmental Justice

Another concern from the anthropocentric perspective is how environmental costs are distributed. This is connected to the issues of social justice and economic justice (as discussed in Chapter 14). One central and difficult issue is the question of how our activities will affect future generations. Do we have an obligation to leave them a clean environment? It is difficult to figure out what justice requires for future generations. But the more pressing issue is the distribution of benefits and harms for actual persons living in the present.

Environmental justice is a mainstream idea, which the EPA defines as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”⁷ It may seem odd that we would need to emphasize that environmental issues should contain an element of social justice and equity. But in reality, it is often the poor and disenfranchised who end up suffering most from environmental degradation. Consider, for example, the fact that affluent nations with established and efficient infrastructure will be able to respond to the changing climate in ways that poorer nations will not. Poor people tend to live closer to polluted lands and toxic waste dumps because more affluent people can move away and can use their resources to fight against pollution in their areas. This is not only a concern within the United States, where poor people suffer most from the effects of pollution, but it is also a concern across the globe. Environmental regulations are often nonexistent or are loosely enforced in developing countries.

One notorious case that frequently comes up in discussions of environmental justice is the gas leak

at the Union Carbide plant in Bhopal, India, in 1984. More than 3,000 people died within the first days of the poisonous gas leak. The final death toll is estimated to be at least 15,000, with the health of more than 600,000 people affected.⁸ Amnesty International puts the death toll higher: 22,000 killed with at least 150,000 still battling diseases of the lungs or liver that are attributed to the toxic waste.⁹ In addition to the human casualties, the disaster left behind polluted land and water, which is still not cleaned up. The local managers responsible for the disaster received minor fines and punishments after being found guilty of criminal negligence in the case. However, the former chairman of Union Carbide, Warren Anderson, never received any punishment. In 2012, an American court dismissed a lawsuit filed by Bhopal residents against Anderson and Dow Chemical, which owns Union Carbide. The dismissal protected Anderson and the company from claims for environmental remediation at the disaster site.¹⁰ This case is remarkable because of the numbers affected, the relatively minor punishments meted out to responsible parties, and because it pushes our understanding of what counts as “the environment.” Often we think of environmentalism as focused on wild natural settings. But the air and water of urban landscapes are also part of the environment. The Bhopal case reminds us that pollution can cause death and that it is often poor people who suffer the most from the impacts of industrial accidents.¹¹

There are a variety of issues that come under the rubric of environmental justice including where waste dumps are located, whether farm workers and farming communities are properly protected from the effects of fertilizers and pesticides, how uranium is mined, how hunting and fishing is regulated and enforced, who pays for environmental remediation efforts, and who guarantees that polluters are punished. These concerns are connected to other social justice concerns and are entirely anthropocentric. This has led some to complain that the focus on environmental justice is a distraction from the larger concern for the value of ecosystems in themselves, apart from human interests. One scholar of environmentalism, Kevin DeLuca, laments this anthropocentric focus, concluding, “Abandoning wilderness-centered environmentalism

is a disastrous error. The finest moments of environmentalism often involve humans exceeding self-concern and caring for wilderness and other species because of their intrinsic being.”¹² This view points us toward the ecocentric or biocentric approach to environmental ethics.

ECOCENTRISM

According to the anthropocentric perspective, environmental concerns ought to be directed to the betterment of people, who alone have intrinsic value. In contrast with this view is one that is generally called an **ecocentric** (or **biocentric**) perspective, which holds that it is not just humans who have intrinsic worth or value, but also such things as plants, animals, and ecosystems. There are variations within this perspective, with some theorists holding that individual life forms have such intrinsic worth and others stressing that it is whole systems or ecosystems that have such value. In this view, ethical questions related to the environment involve determining what is in the best interests of these life forms, or what furthers or contributes to (or is a satisfactory fit with) some ecosystem.

Ecocentrists are critical of anthropocentrists. Why, they ask, do only humans have intrinsic value while everything else has merely instrumental value for us? Some fault the Judeo-Christian tradition for this view. In particular, they single out the biblical mandate to “subdue” the earth and “have dominion over the fish of the sea and over the birds of the air and every living thing that moves upon the Earth” as being responsible for this instrumentalist view of nature and other living things.¹³ Others argue that anthropocentrism is a reductionist perspective. All of nature, according to this view, is reduced to the level of “thing-hood.” The seventeenth-century French philosopher René Descartes is sometimes cited as a source of this reductionist point of view because of his belief that the essential element of humanity is the ability to think (“I think, therefore I am,” etc.) and his belief that animals are mere biological machines.¹⁴ Early evolutionary accounts also sometimes depicted humans as the pinnacle of evolution or the highest or last link in some great chain of being. We can ask ourselves whether we place too high a value on human beings and their

powers of reason and intelligence. Ecocentrists criticize the view that we ought to seek to understand nature so that we can have power over it because it implies that our primary relation to nature is one of domination.

Ecocentrists hold that we ought rather to regard nature with admiration and respect because nature and natural beings have intrinsic value. Let us return to our example of the 2,000-year-old sequoia tree. You may have seen pictures of trees large enough for tunnels to be cut through, allowing cars to pass. In the 1880s, such a tunnel was cut through a giant sequoia near Wawona, California, on the south end of what is now Yosemite National Park. Tourists enjoyed driving through the tunnel. However, some people claimed that this was a mutilation of and an insult to this majestic tree. They said that the tree itself had a kind of integrity, intrinsic value, and dignity that should not be invaded lightly. Another way to put it would be to say that the tree itself had moral standing.¹⁵ What we do to the tree itself matters morally, they insisted.

On what account could trees be thought to have this kind of moral standing? All organisms, it might be argued, are self-maintaining systems.¹⁶ Because they are organized systems or integrated living wholes, organisms are thought to have intrinsic value and even moral standing. The value may be only *prima facie*, but nevertheless they have their own value in themselves and are not just to be valued in terms of their usefulness to people. According to this perspective, the giant sequoias of Wawona should not merely be thought of in terms of their tourist value.

Further, there are things that can be good and bad for the trees themselves. The tunnel in the Wawona tree, for example, eventually weakened the tree, and it fell during a snowstorm in 1968. Although trees are not **moral agents**—beings who act responsibly for moral reasons—they may still be thought of as moral patients. A **moral patient** is any being for which what we do to it matters in itself. A moral patient is any being toward whom we can have *direct duties* rather than simply *indirect duties*. If a tree is a moral patient, then we ought to behave in a certain way toward the tree for its sake and not just indirectly for the sake of how it will eventually

affect us. Ecocentrists may argue that there are things that are in the best interests of trees, even if the trees take no conscious interest in them.

In addition to those ecocentrists who argue that all life forms have intrinsic value, there are others who stress the value of ecosystems. An *ecosystem* is an integrated system of interacting and interdependent parts within a circumscribed locale. They are loosely structured wholes. The boundary changes and some members come and go. Sometimes there is competition within the whole—as in the relation between predators and prey in a given habitat. Sometimes there is *symbiosis*, with each part living in cooperative community with the other parts—as in the relationship between flowers and the bees that pollinate them. The need to survive pushes various creatures to be creative in their struggle for an adaptive fit. There is a unity to the whole, but it is loose and decentralized. Why is this unity to be thought of as having value in itself?

One answer is provided by the environmental philosopher Aldo Leopold. In the 1940s, he wrote in his famous essay “The Land Ethic” that we should think about the land as “a fountain of energy flowing through a circuit of soils, plants, and animals.”¹⁷ Look at any environment supporting life on our planet and you will find a *system* of life—intricately interwoven and interdependent elements that function as a whole. Such a system is organized in the form of a *biotic pyramid*, with myriad smaller organisms at the bottom and gradually fewer and more complex organisms at the top. Plants depend on the earth, insects depend on the plants, and other animals depend on the insects. Leopold did not think it amiss to speak about the whole system as being healthy or unhealthy. If the soil is washed away or abnormally flooded, then the whole system suffers or is sick. In this system, individual organisms feed off one another. Some elements come and others go. It is the whole that continues. Leopold also believed that a particular type of ethics follows from this view of nature—a biocentric or ecocentric ethics. He believed that “a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends to do otherwise.”¹⁸ The system has a certain *integrity* because it is a unity of interdependent elements that combine

to make a whole with a unique character. It has a certain *stability*, not in that it does not change, but that it changes only gradually. Finally, it has a particular *beauty*. Here beauty is a matter of harmony, well-ordered form, or unity in diversity.¹⁹ When envisioned on a larger scale, the entire Earth system may then be regarded as one system with a certain integrity, stability, and beauty. Morality becomes a matter of preserving this system or doing only what befits it.

The kind of regard for nature that is manifest in biocentric views is not limited to contemporary philosophers. Native American views on nature provide a fertile source of biocentric thinking. For example, Eagle Man, an Oglala Sioux writer, emphasizes the unity of all living things. All come from tiny seeds and so all are brothers and sisters. The seeds come from Mother Earth and depend on her for sustenance. We owe her respect, for she comes from the “Great Spirit Above.”²⁰ Also, certain forms of European and American Romanticism imbue nature with spiritual value. The transcendentalists Ralph Waldo Emerson and Henry David Thoreau fall into this category. Transcendentalism was a movement of romantic idealism that arose in the United States in the mid-nineteenth century. Rather than regarding nature as foreign or alien, Emerson and Thoreau thought of it as a friend or kindred spirit. Acting on such a viewpoint, Thoreau retreated to Walden Pond to live life to its fullest and commune with nature. He wanted to know its moods and changes and all its phenomena. Although Thoreau and Emerson read the “lessons” of nature, they also read Eastern texts and were influenced by the history of Western philosophy. Some have characterized aspects of their nature theory as idealism, the view that all is ideas or spirit; others characterize it as pantheism, the doctrine that holds that God is present in the whole of nature. The transcendentalists influenced John Muir, the founder of the Sierra Club. Muir held a similar view of the majesty, sacredness, and spiritual value of nature.²¹ Muir transformed his love of nature into practical action, successfully petitioning Congress for passage of a national parks bill that established Yosemite and Sequoia national parks.

Romantic and idealistic ideas provide a stark contrast to anthropocentric views of a reductionist

type. However, they also raise many questions. For example, we can ask the transcendentalist how nature can be spirit or god in more than a metaphorical sense. And we can ask proponents of views such as Aldo Leopold's the following question: Why is it that nature is good? Nature can be cruel, at least from the point of view of certain animals and even from our own viewpoint as we suffer the damaging results of typhoons or volcanic eruptions. And, more abstractly, on what basis can we argue that whatever exists is good?

Deep Ecology

Another variant of ecocentrism is the deep ecology movement. Members of this movement wish to distinguish themselves from mainstream environmentalism, which they call "shallow ecology" and criticize as fundamentally anthropocentric. The term *deep ecology* was first used by Arne Naess, a Norwegian philosopher and environmentalist.²² Deep ecologists take a holistic view of nature and believe that we should look more deeply to find the root causes of environmental degradation. The idea is that our environmental problems are deeply rooted in the Western psyche, and radical changes of viewpoint are necessary if we are to solve these problems. Western reductionism, individualism, and consumerism are said to be the causes of our environmental problems. The solution is to rethink and reformulate certain metaphysical beliefs about whether all reality is reducible to atoms in motion. It is also to rethink what it is to be an individual. Are individuals separate and independent beings? Or are they interrelated parts of a whole?

According to deep ecologists, solving our environmental problems requires a change in our views about what is a good quality of life. The good life, deep ecologists assert, is not one that stresses the possession of things and the search for satisfaction of wants and desires. Instead, a good life is one that is lived simply, in communion with one's local ecosystem. Arne Naess lived his message. He retreated to a cabin in the mountains of Norway, which he built with his own hands. He lived a modest life until his death at age ninety-six in 2009.

In addition to describing the need for radical changes in our basic outlook on life, the deep

ecologist platform also holds that any intrusion into nature to change it requires justification. If we intervene to change nature, then we must show that a vital need of ours is at stake.²³ We should be cautious in our actions because the results of our actions may be far-reaching and harmful. And we should view nature *as it is* as good and right and well balanced. Deep ecology also includes the belief that the flourishing of nonhuman life requires a "substantial decrease in the human population."²⁴ George Sessions argues that "humanity must drastically scale down its industrial activities on Earth, change its consumption lifestyles, stabilize" and "reduce the size of the human population by humane means."²⁵

Some critics maintain that deep ecologists are misanthropic because of their interest in reducing the human population, or suggest that they are advocating totalitarian methods for achieving a reduction in human population. Some go so far as to malign deep ecology as "eco-fascism," equating it with fascist plans to create an ecological utopia through population control. Others worry that there may be implicit eugenic and imperialistic agendas when affluent Americans and Europeans advocate population control (see the Ramachandra Guha reading at the end of this chapter). Deep ecologists would reply, however, that they recognize that population reduction can be achieved only through humane methods such as the empowerment of women and making contraception available.

The members of the deep ecology movement have been quite politically active. Their creed contains the belief that people are responsible for Earth. Beliefs such as this often provide a basis for the tactics of groups such as Earth First! Some radicals advocate direct action to protect the environment including various forms of "ecosabotage"—for example, spiking trees to prevent logging, and cutting power lines.²⁶ It is important to note that Arne Naess himself was interested in nonviolence. He wrote extensively about Gandhi's nonviolent methods and he conceived his commitment to the environment in conjunction with Gandhian ideas about the interconnectedness of life. And he employed nonviolent methods in his own protests—such as chaining himself to a boulder to protest a project aimed at building a dam on a river.

Critics of deep ecology describe aggressive forms of environmental protest as “ecoterrorism.”²⁷ Of course, there are important distinctions to be made between nonviolent protest, civil disobedience, and more violent forms of protest. Nonetheless, deep ecologists maintain that the stakes are high and that action should be taken to change the status quo—even if this action is only at the level of personal lifestyle choices. On a philosophical level, the view that all incursions into nature can be justified only by our vital needs seems to run counter to our intuitions. The implication here is that we must not build a golf course or a house patio because these would change the earth and its vegetation, and the need to play golf or sit on a patio is hardly vital. Do natural things have as much value as people and their interests? The view that nature itself has a “good of its own” or that the whole system has value in itself raises complex metaphysical and psychological questions. However we may feel about these issues, deep ecologists provide a valuable service by calling our attention to the possible deep philosophical roots and causes of some of our environmental problems.

Ecofeminism

Another variant of ecological ethics is called *ecofeminism* or *ecological feminism*.²⁸ It may be seen as part of a broader movement that locates the source of environmental problems not in metaphysics or worldviews, as deep ecologists do, but in social practices. *Social ecology*, as this wider movement is called, holds that we should look to particular social patterns and structures to discover what is wrong with our relationship to the environment. Ecofeminists believe that the problem lies in a male-centered view of nature—that is, one of human domination over nature. According to Karen Warren, a philosopher and environmental activist, ecofeminism is “the position that there are important connections . . . between the domination of women and the domination of nature, an understanding of which is crucial to both feminism and environmental ethics.”²⁹ Note here that deep ecologists and ecofeminists do not necessarily agree. The deep ecologists may criticize ecofeminists for concentrating insufficiently on the environment, and ecofeminists may accuse deep ecologists of the very male-centered

view that they believe is the source of our environmental problems.³⁰

A variety of ecofeminist views are espoused by diverse groups of feminists.³¹ One version celebrates the ways that women differ from men. This view is espoused by those who hold that women—because of their female experience or nature—tend to value organic, non-oppressive relationships. They stress caring and emotion, and they seek to replace conflict and assertion of rights with cooperation and community. This idea has obvious connections with the work of those interested in the feminist ethics of care (as discussed in Chapter 9). From this perspective, a feminine ethic should guide our relationship to nature. Rather than use nature in an instrumentalist fashion, they urge, we should cooperate with nature. We should manifest a caring and benevolent regard for nature, just as we do for other human beings. One version of this view would have us think of nature itself as in some way divine. Rather than think of God as a distant creator who transcends nature, these religiously oriented ecofeminists think of God as a being *within* nature. Some also refer to this God as “Mother Nature” or “Gaia,” after the name of a Greek goddess.³²

Another version of ecofeminism rejects the dualism often found in the Western philosophical tradition. They hold that this tradition promotes the devaluing and domination of both women and nature. Rather than divide reality into contrasting elements—the active and passive, the rational and emotional, the dominant and subservient—they encourage us to recognize the diversity within nature and among people. They would similarly support a variety of ways of relating to nature. Thus, they believe that even though science that proceeds from a male-oriented desire to control nature has made advances and continues to do so, its very orientation causes it to miss important aspects of nature. If instead we also have a feeling for nature and a listening attitude, then we might be better able to know what actually is there. They also believe that we humans should see ourselves as part of the community of nature, not as distinct, non-natural beings functioning in a world that is thought to be alien to us. Some versions of ecofeminism emphasize the way that women understand their bodies and their

reproductive power, maintaining that women have a closer relationship with the body and thus with the natural world. Others view feminine categories as socially constructed, albeit in a way that emphasizes the female connection with nature (and the male as liberated from and thus able to dominate nature).

It is sometimes difficult to know just what, in particular, are the practical upshots of ecocentrism, ecological feminism, and deep ecology. We noted previously that Naess and the deep ecologists emphasize living simply and in connection with the local environment. Ecofeminists might add that a sense of justice and equality also requires that we attend to the ways in which environmental destruction impacts women and the way that male-dominant gender roles tend to reinforce exploitation and domination of nature. Ecofeminism and deep ecology both pose a serious challenge to the status quo and its anthropocentric and dominating approach to the natural world.

Ethical anthropocentrists will advocate wise and judicious use of nature, one that does not destroy the very nature that we value and on which we depend. But nonanthropocentrists maintain that we must care for and about nature for its own sake and not just in terms of what it can do for us. This debate is about the very place of human beings within the natural world.

CURRENT ISSUES

We can now take these anthropocentric and ecocentric theories and examine how they might apply to environmental issues confronting us today. We will consider the following problems: climate change, ozone depletion, waste disposal and pollution, and wilderness preservation. We will also consider international environmental conventions as a possible means of addressing global environmental issues. And finally we will consider the vexing problem of sustainable development and a problem known as “the tragedy of the commons.”

Climate Change

The great majority of scientists now agree that our modern industrial society has created a potentially deadly phenomenon known as the *greenhouse effect*, *global warming*, or *climate change*. There is

no denying that the global climate is changing, as the level of carbon dioxide in the atmosphere has increased during the past century. In the spring of 2013, the concentration of carbon dioxide (CO₂) in the atmosphere was measured at a new high of 400 parts per million (or ppm). This level of CO₂ concentration had not been seen on Earth since the Pliocene epoch, 2.5 million years ago, when Earth was three degrees Centigrade warmer than it is today and when sea levels were five meters higher.³³ Coastlines are crumbling as the climate changes and sea levels rise.³⁴ There is substantial, albeit complicated, evidence that storms are increasing in severity as a result of climate change heating up the oceans.³⁵ And there is no question that the Arctic ice cap is melting, with ever-larger swaths of ice disappearing during the summer months. In the summer of 2012, the seasonal Arctic melt reached a new low, with the ice covering only about 24 percent of the Arctic Ocean. In the 1970s, coverage during this season was around 50 percent.³⁶ In the winter of 2013, NASA indicated that the winter maximum (the maximum extent of Arctic sea ice) was the fifth lowest sea-ice maximum measured in the past thirty-five years. According to NASA, “some models predict that the Arctic Ocean could be ice-free in the summer in just a few decades.”³⁷ Melting Arctic ice is not only a *sign* of climate change; it is also a *contributor* to the process. The white Arctic ice reflects the sun, so the more ice there is, the more heat is reflected without being absorbed by the ocean. As the ice melts, however, the dark blue water of the ocean absorbs the solar rays no longer being reflected by the ice, which in turn warms the nearby air. The warmer air melts more ice, and so on, creating a feedback loop.

The Arctic ice cap is not the only significant melting process associated with climate change. The ice that covers Greenland, the biggest land mass of the Arctic region, has also been melting at an alarming rate and slipping into the sea. In 2012, there was a rapid melting event that caused 97 percent of the Greenland ice sheet to shed water. If Greenland’s 680,000 cubic miles of ice melted, it would raise sea levels by up to 20 feet.³⁸ While most experts think it is unlikely that this massive rise in sea levels will happen for several hundred years, some experts

believe that sea levels could rise by up to three feet by 2100.³⁹ The U.S. Environmental Protection Agency (EPA) predicts that by 2100, global temperatures will rise from 2°F to 11.5°F and sea levels will rise about two feet.⁴⁰ Climate change has also caused the oceans to become more acidic as carbon dioxide is absorbed into the oceans. This process has already had negative impacts on delicate marine life, such as the oysters of the Pacific Northwest: oyster shells don't form properly in more acidic water.⁴¹ There will be adverse impacts on fish and corals as the oceans become more acidic.

Melting Arctic ice may also change patterns of ocean currents that have been stable for the past 10,000 years. The Gulf Stream, for example, pulls warm water north from near the equator and into the north Atlantic, where some of it evaporates; as the water evaporates, the ocean becomes saltier and heavier and the denser water sinks, cooling and starting a return path to the south. Changing temperatures could alter this process. Shifts in the Gulf Stream could cause weather and climatic changes in Europe and North America, although scientists disagree about what these impacts might be. Some warn that Europe would cool if the Gulf Stream shifted, and others think this is unlikely.⁴² While this dispute is an indication of the difficulty of making predictions about climate change, the vast majority of scientists agree that the atmosphere and the oceans are changing.⁴³

Climate change may produce hundreds of millions of environmental refugees, which is an environmental justice concern. Those refugees may be displaced by rising tides, storm damage, and changes in agricultural production.⁴⁴ Residents of low-lying islands—such as Kiribati, the Maldives, and the Seychelles—and low, flood-prone countries—such as Bangladesh—may be dislocated as sea levels rise and river floods become harder to control.⁴⁵

Some skeptics dispute whether the changes are entirely man-made, but the vast majority of experts believe that one of the major causes of climate change is the burning of fossil fuels, which are the primary energy source for modern societies. The resulting gases—carbon dioxide, methane, fluorocarbons, and nitrous oxide, among others—are released into the atmosphere. There, these gases

combine with water vapor and prevent the sun's infrared rays from radiating back into space. The trapped solar radiation contributes to increased air temperature. In this way, the gases function much as do the glass panes of a greenhouse. Newly released gases will remain in the atmosphere for thirty to a hundred years; since greenhouse gas emissions continue to rise, their buildup in the atmosphere is expected to increase over time. Automobile exhaust, along with industrial power plants and agricultural operations, produce most of the gases that lead to climate change. Deforestation also contributes to the warming because there are fewer trees and other plant life to absorb carbon dioxide before it reaches the atmosphere.

According to the EPA, carbon dioxide accounts for 84 percent of U.S. greenhouse gas emissions.⁴⁶ Carbon dioxide (CO₂) is emitted when fossil fuels are burned to produce electricity or to fuel cars and other forms of transportation. CO₂ is also produced as a by-product of industrial processes and, along with methane, as a result of animal agriculture. According to the United Nations, “emissions due to human activities have grown since pre-industrial times, with an increase of 70 percent between 1970 and 2004.” The UN also states, “climate scientists have determined that temperature increases should be limited to 2°C—to avoid causing irreversible damage to our planet. To achieve this, global emissions need to peak by 2015 and decline thereafter reaching a reduction of 50 percent by 2050.”⁴⁷ The nations of the world agreed to attempt to limit global temperature increase to 2°C in 2009 at a global summit in Copenhagen. To meet that goal, it was agreed that carbon dioxide levels in the atmosphere must be kept to 350 parts per million. However, in 2012 and 2013, mean CO₂ levels were around 395 parts per million, according to the National Oceanic and Atmospheric Administration. And as we've seen, on some days in 2013, the level has been as high as 400 parts per million.⁴⁸ This makes it unlikely that global temperature increase will be limited to 2°C.

Although the bulk of greenhouse gases emitted since the start of the Industrial Revolution have come from Europe, the United States, and other developed regions, recent increases in carbon dioxide levels are often attributed to growth in the developing

world, especially in China.⁴⁹ According to the EPA (based upon 2008 data), the main CO₂ producers as a share of the world's total CO₂ emitted are China (23 percent), the United States (19 percent), and the European Union (13 percent).⁵⁰

Climate changes have occurred throughout Earth's history, and while they have usually been gradual, that has not always been the case. Sixty-five million years ago, the dinosaurs are thought to have been wiped out by a dramatic and rapid change in climate caused by a giant meteorite that hit Earth near Mexico's Yucatán Peninsula. The meteorite may have put so much dust into the air that it blocked much of the sun's light, causing temperatures to drop and plants to die—which in turn brought about the demise of the dinosaurs. Within the time span of human existence, climate changes have usually occurred over several generations, allowing people to adapt. If these changes occur rapidly, however, such adaptation becomes more difficult. Food supplies, for example, could be severely stressed. Reduced land fertility could also pose a threat to international security. If crop yields decrease and water shortages increase, peoples and nations suffering severe shortages may resort to violence. These people may migrate to urban slums, causing overcrowding, widespread poverty, and infrastructure breakdown.⁵¹ All of the issues listed above are anthropocentric concerns—they are focused on how climate change may impact human beings. These issues might also be supplemented with a more ecocentric focus on the species and ecosystems that may be disrupted by climate change.

How do we know that present-day global warming is not just a part of a natural pattern? Scientists have determined that recent temperatures and the increased levels of carbon dioxide in the atmosphere are dramatically greater than anything that has occurred in the past. Scientists have drilled deep into the ice and brought up cylindrical *ice cores* that have markings similar to the rings inside of trees. They can read the age of the ice cores and analyze the chemicals and air bubbles in them to determine the average temperature of each year, as well as the carbon dioxide levels during each year. Samples as old as six hundred thousand years have been obtained, and from these samples scientists know that the

temperature and greenhouse gases have increased with unprecedented speed in the past decades. From this they can also predict how temperatures will continue to rise unless emissions are controlled.⁵²

Scientists still disagree, however, on how much Earth will warm, how quickly it will happen, and how different regions will be affected. However, evidence is now accumulating for the acceleration of this effect in the form of receding glaciers, rising sea levels, and the spreading of plant and animal species farther north and to higher altitudes that were previously too cold to support such life. Some European butterfly and bird species have moved their habitats northward of their previous ranges. Unfortunately, some studies show that not all species are able to keep pace with rapidly changing climate zones. During the past twenty years, some butterfly species have failed to keep pace with changing climate zones by a magnitude of approximately 85 miles; some birds are now living 130 miles from their natural climate range.⁵³ When we consider the problem of animals unable to adapt quickly enough to the planet's changing climate zones, should we focus on the intrinsic value of butterflies and birds, or should we focus on what this may portend for human beings as global temperatures continue to rise?

Further evidence of an accelerated global warming can be seen in the melting of mountain glaciers.⁵⁴ While some ecocentrists may argue that mountain glaciers have a kind of intrinsic value, the loss will also have a practical impact on human communities that depend upon glaciers for their water supply. The melting of mountain glaciers can also produce more severe flooding during the rainy season, along with less regular flows of water during the rest of the year.⁵⁵

Some people may benefit from climate change—say, those living in northern latitudes. But it is most likely that changing crop yields and lost coastlines will have negative impacts on billions of human beings. Returning us to the concerns of environmental justice, it is important to note that those who are historically most responsible for climate-changing emissions are the least likely to be harmed. Affluent people living in developed countries will be able to adapt and respond to climate change, while poor people in developing countries are most likely to be

harmed. Moreover, the cost to future generations must also be considered. How much we worry about the impact on our descendants will depend on the expected severity of the effects. Those who calculate the costs and benefits must also factor in the uncertainties that are involved.

What can be done about global warming? And is it too late? Scientists generally believe that we may still have time to prevent radical climate change. But they tend to agree that we need to reduce the emission of greenhouse gases now. James Hansen, the former head of the NASA Goddard Institute for Space Studies, has sounded a significant alarm. According to Hansen, if we continue to exploit fossil fuel reserves, the climate will be radically altered:

Concentrations of carbon dioxide in the atmosphere eventually would reach levels higher than in the Pliocene era, more than 2.5 million years ago, when sea level was at least 50 feet higher than it is now. That level of heat-trapping gases would assure that the disintegration of the ice sheets would accelerate out of control. Sea levels would rise and destroy coastal cities. Global temperatures would become intolerable. Twenty to fifty percent of the planet's species would be driven to extinction. Civilization would be at risk.⁵⁶

Hansen's argument is ultimately anthropocentric: he means *human* civilization is at risk. Because Hansen views the risk as so great and the consequences so dire, he opposes new fossil fuel projects that would ultimately lead to more CO₂ emissions—including the development of tar sands in Canada and new pipelines to transport crude oil. From Hansen's perspective, remaining fossil fuel reserves should stay buried in the ground, no matter how profitable or useful they may prove in the short term.

Among the means of reducing greenhouse gases are better mileage standards for cars and expanded public transportation options. Other methods include alternative sources of power, such as wind, solar, and nuclear. European countries have taken the lead in this effort. Germany, for example, has made a commitment to abandon fossil fuels by 2050 and in recent years has made great strides toward replacing its fossil fuel infrastructure with renewable energy sources.⁵⁷ According to Stanford professor Mark Z. Jacobsen: "It's absolutely not true that we need

natural gas, coal, or oil—we think it's a myth. . . . You could power America with renewables from a technical and economic standpoint. The biggest obstacles are social and political—what you need is the will to do it."⁵⁸ Opponents of alternative energy sources argue that the economic costs would be prohibitive and would place great burdens on taxpayers. Whether or not this is true, the position points to a different set of values and a different assessment of costs and benefits.

Instead of, or in addition to, greater fuel efficiency standards and alternative energy sources, some suggest imposing a carbon tax on people and companies that burn fossil fuels. This tax could be used, for example, to reimburse or give tax credits to homeowners who use solar cells or energy-efficient appliances; the tax could also be used to fund research into possible means of capturing carbon dioxide and preventing it from being released into the atmosphere. A small tax could yield some \$50 billion for such purposes. Former Vice President Al Gore even proposes that such a tax be used in place of payroll taxes for Social Security and Medicare.⁵⁹

Other proposed solutions to climate change involve so-called "geo-engineering" projects. These technological solutions include proposals to remove carbon from the atmosphere and store it underground, as well as proposals to protect Earth from the sun—either by building shades in space or by stimulating volcanoes to produce ash, which would reflect sunlight. These geo-engineering solutions aim to fix the problem without addressing the underlying issues of consumption and pollution. From the standpoint of deep ecology, such an approach looks like another example of human hubris. But proponents of geo-engineering argue that it is too late to halt climate change by returning to the sort of simple, eco-friendly living espoused by deep ecologists. Furthermore, as the climate continues to change, environmental justice concerns will point in the direction of plans to mitigate the damage that climate change will create for vulnerable human populations.

Ozone Depletion

A second environmental problem—and one about which activists and scientists have been concerned

for decades—is ozone depletion. In the 1970s scientists detected holes or breaks in the layer of ozone at the upper reaches of the stratosphere. This layer of ozone protects Earth from the damaging effects of excessive ultraviolet radiation from the sun, which can cause skin cancer and cataracts. The holes in the ozone layer were determined to be caused by chlorine-bearing pollutants such as the chlorofluorocarbons, which were widely used in fire extinguishers and as refrigerants, cleaning agents, and spray propellants. Climate change is also a factor in ozone depletion, as the heating of the lower atmosphere has an impact on ozone in the upper atmosphere.

Like global warming, ozone depletion negatively impacts both humans and wildlife. For example, fish in waters around Great Britain “are suffering sunburn and blisters caused by the thinning ozone layer,” and such effects threaten some fish species with extinction.⁶⁰ And the ozone hole over the South Pole has affected the circulation of ocean waters in the Southern Ocean.⁶¹ This will cause further changes in ocean temperatures, which will impact global climate. The good news is that the international community worked together to ban the use of the chlorofluorocarbons (CFCs). The Montreal Protocol (1987) called for many developed countries to phase out their use by 1996. This is a hopeful sign of international cooperation. However, given current rates of depletion and the amount of CFCs in the atmosphere, it may take fifty years for the ozone layer to repair itself.⁶²

From a cost-benefit perspective, we should ask whether the cost to us from decreasing or eliminating the causes of ozone depletion is worth the savings in human lives. Here again we come up against the issue of how to value human life. The greater its value, the more surely we ought to stop using these chemicals, and the harder we ought to work to find alternatives. The issue of ozone depletion may be viewed as one example of the way that international cooperation based on cost-benefit analysis can work to solve some environmental problems.

Waste Disposal and Pollution

Another issue of environmental concern is waste disposal and pollution. Like global warming and ozone depletion, the negative impacts of these problems

on humans and animals are far-reaching. Humans produce tons of garbage each year that must be put somewhere. Just how much garbage is there? According to the EPA, “In 2010, Americans generated about 250 million tons of trash and recycled and composted over 85 million tons of this material, equivalent to a 34.1 percent recycling rate. On average, we recycled and composted 1.51 pounds of our individual waste generation of 4.43 pounds per person per day.”⁶³ While the United States has the world’s highest rate of per capita garbage production, China is quickly catching up. According to the World Bank, China has the fastest growing rate of waste production.⁶⁴

Typical American trash includes a variety of disposable items. According to the Clean Air Council, every year Americans use one billion shopping bags, which create tons of landfill waste. Less than 1 percent of plastic bags are recycled each year.⁶⁵ The problem with plastic shopping bags is that they do not biodegrade, or break down, in landfills. Instead, they break into small pieces, which contaminate the soil and water. Cities across the country have considered banning plastic bags or imposing a use tax on them. In 2013, the California State Assembly considered a statewide ban on such bags, which was defeated. Proponents of the ban argued that the plastic bags make up a majority of marine debris and cost millions to dispose of. But critics pointed out that paper bags are not really that much better—since they take up more space in landfills.⁶⁶ Many say the preferred option is reusable cloth bags; however, some maintain that reusable cloth shopping bags are unsanitary and spread disease, citing a study that showed that foodborne illness increased in San Francisco after the city banned plastic bags in 2007.⁶⁷

We also generate a lot of garbage through the use of disposable cups and food service items. The Clean Air Council reports that the average American office worker uses about 500 disposable cups every year.⁶⁸ Americans use one billion Starbucks cups per year.⁶⁹ Starbucks has worked to find ways to make sure that those cups are recyclable and has recently introduced reusable cups as an alternative. But garbage generated by fast-food restaurants still remains a common feature of urban litter.⁷⁰

So-called e-waste is also becoming a major problem. This includes outdated cellphones, computers, TVs, and printers. Approximately 20–50 million tons of this waste is discarded globally per year, with projected e-waste of 40–70 million tons by 2015.⁷¹ Such items contain huge amounts of toxins: beryllium, cadmium, chromium, lead, mercury, and so on. Some electronics companies are working hard to find less harmful ways to deal with electronic waste. But too often there are environmental justice issues involved, as electronic waste is commonly sent to countries in Africa and Asia, where it is dumped, often at the expense of local populations and pollution of the local environment.⁷² One recent study indicates that people living near an electronic waste dump in China face elevated cancer risks, as a result of exposure to hazardous chemicals. Residents were melting down scavenged electronic products in their homes and backyards in order to extract precious metals concealed within those products, with health hazards resulting from exposure to toxic fumes produced during this process.⁷³

One obvious solution to the e-waste problem is recycling. Indeed, the solution to the problem of waste disposal in general is recycling. For example, recycled bottles and cans can be turned into reusable metal and glass, as well as roads, bike parts, and even carpets.⁷⁴ Americans use more than eighty billion aluminum beverage cans every year, recycling over sixty billion of them.⁷⁵ The energy used to recycle aluminum is 95 percent less than the cost of manufacturing cans from virgin materials. Recycling one aluminum can saves enough energy to keep a 100-watt bulb burning for nearly four hours.⁷⁶

Recycling, in fact, is tackling a wide variety of problems related to waste disposal and pollution. One promising idea is to find ways to convert food and plant waste into fuel. Organic material converted to fuel is known as *biomass fuel* or *biofuel*. Methane gas can be collected from landfills. And plants can be converted directly into usable forms of energy—such as corn that is converted into ethanol. Biomass fuels can be produced in ways that contribute to pollution and to climate change, but when done right—using waste products, rather than growing plants only for fuel consumption—they could hold one of the keys to a sustainable future. One promising idea is to

use switchgrass—a common grass native to North America—to produce biofuels in the form of pellets that can be burned in stoves or in the form of ethanol, which can run combustion engines.⁷⁷

While the use of recycling and the development of biomass fuels offer solutions to the problem of waste and pollution, these approaches remain firmly within the anthropocentric approach that emphasizes minimizing costs and maximizing benefits for human beings. A simpler solution, and one that is espoused by advocates of ecocentrism, would be to cut down on consumption in general. From this perspective, it is not enough to recycle or to drive a biofuel vehicle—since recycling itself uses resources and energy and the biofuel vehicle still contributes its share of pollution. A more ecocentric approach would encourage people to ask, for example, whether it is necessary to use aluminum cans at all (not just whether it is necessary to recycle them) or whether it is possible to cut down on driving. The anthropocentric approach is not necessarily opposed to cutting down on consumption; however, it is in favor of finding ways to maximize our ability to consume while minimizing the ecological impact of consumption.

Wilderness Preservation

The use and preservation of the planet's wild and undeveloped areas is an issue of enduring ethical concern. According to the University of Montana's Wilderness.net information site, the United States now has 758 designated wilderness areas, encompassing 109,510,858 acres in forty-four states and Puerto Rico. That means that about 5 percent of the United States is protected as wilderness—an area that is slightly larger than the state of California. Much of this wilderness is in Alaska. Within the lower forty-eight states, about 2.7 percent of land is preserved as wilderness—an area about the size of Minnesota.⁷⁸ If these wilderness areas were not set aside and protected, their natural resources—including oil reserves, minerals, and forests—would almost certainly be developed. But we also value these wilderness areas for our own recreation, including fishing and hunting, as well as for the habitats they provide to various animal species.

One example of the controversy over protecting wilderness is the question of drilling for oil in

Alaska's Arctic National Wildlife Refuge. The refuge is the last part of Alaska's Arctic coastline not open for oil production; its ecosystem includes a number of birds and animals in a tundra area. We might have an ecocentric concern for protecting this fragile ecosystem. Opponents of oil development in the refuge argue that such development would hurt the ecosystem. It might also have a negative impact on the humans who hunt the animals that live there. By contrast, those who argue in favor of drilling point out that the refuge contains large oil deposits that could benefit the economy. As the price of gasoline and other petroleum products goes up, we are looking for new, unexplored oil reserves—the refuge is just such a site, they argue. Advocates of drilling maintain that efforts to protect sensitive wilderness areas are preventing necessary economic development.⁷⁹ Opponents argue that oil development would create unacceptable environmental costs, accelerating climate change and harming animals and natural ecosystems.

Related issues include the construction of oil pipelines and the use of *fracking*, a process for oil and gas extraction that uses hydraulic fracturing (or “fracking”) of subterranean rock formations to release gas and oil. The procedure allows extractors to reach reserves that are inaccessible through other drilling technologies. Opponents of fracking argue that the chemicals used in the process are hazardous, and that these chemicals can migrate and contaminate groundwater. Opponents have also argued that fracking can cause earthquakes, even in seismically stable regions. Defenders of the process argue that such risks are negligible and that the benefits of recovering more fossil fuels outweigh the risks.

The means of extraction isn't the only controversial issue related to oil and gas development. Also a subject of intense debate is the way these resources are transported to market. One contentious prospective project is the Keystone XL Pipeline, which aims to deliver petroleum products from Alberta, Canada, to the United States. The pipeline would carry 830,000 barrels of petroleum daily from the tar sands of Alberta to the Gulf Coast. The route for the proposed pipeline has been changed to avoid sensitive environmental areas, such as the Sand Hills of Nebraska, but environmentalists argue that

these modifications are insufficient. Furthermore, environmentalists are opposed to the development of petroleum products from the tar sands of Alberta because of the large-scale destruction of forests and other ecosystems involved in the process. They argue that instead of producing more fossil fuels in wild places, the burning of which contributes to climate change, we should be investing in alternative energy sources.⁸⁰ The National Wildlife Federation, for example, says, “Tar sands oil is one of the dirtiest, costliest, and most destructive fuels in the world. Unlike conventional crude oil, unrefined tar sands is hard to extract, and in order to mine this resource, oil companies are digging up tens of thousands of acres of pristine forest in Alberta, Canada and leaving behind a toxic wasteland.”⁸¹ But on the other hand, the demand for oil continues to rise: the development of tar sand deposits and fracking are driven by the market demand for petroleum products. Alberta's oil reserves are the third largest on Earth, with current production of about 1.6 million barrels per day.⁸² If we want to continue driving gasoline-fueled cars the way we do, we'll need that oil.

Forests and wilderness areas are valuable for many reasons. They can provide beneficial new technologies—such as cures for diseases derived from wild species of plants and animals. Forests also provide habitats for wildlife, including threatened species. They provide us with leisure and relaxation, and with recreational opportunities such as white-water rafting, fishing, hiking, and skiing. They also provide aesthetic and religious experiences, and a chance to commune with the wider world of nature. But the question remains: Are we preserving wilderness for its own sake—or should wilderness areas be viewed as resource reserves, which ought to be developed when and how humans need them?

International Environmental Conventions

Because of widespread concerns about these and other environmental issues, many international meetings and conventions have been held over the past several decades. One example is Earth Summit, the U.N. Conference on Environment and Development, which was held in Rio de Janeiro, Brazil, in 1992. Its focus was the interrelation between environmental issues and sustainable development.

At its conclusion, the conference issued, among other documents, a Framework Convention on Climate Change, a Convention on Biological Diversity, and a Statement of Forest Principles. The Framework Convention on Climate Change went into force in March 1994 and had as its primary objective “stabilization of greenhouse gas concentrations in the atmosphere.” The United States, along with many other nations, signed this agreement—updated in Kyoto, Japan, in 1997, under an agreement known as the Kyoto Protocol. Key provisions of the protocol included mandatory restrictions on greenhouse gas emissions to “at least 5 percent below levels measured in 1990” by the year 2012.⁸⁵ The protocol also allowed the thirty-five industrialized countries that were covered by it to “earn credits toward their treaty targets by investing in emissions cleanups outside their borders,” a so-called *cap-and-trade* system.⁸⁴ Developing countries such as India and China were exempt from the controls so as to give them a better chance to catch up economically with the more developed nations. Although the United States helped develop this agreement, Congress refused to pass it and President George W. Bush pulled out of the agreement when he took office in 2001, holding that it was flawed and would hurt the U.S. economy. (Even though the United States did not ratify the treaty, the mayors of more than five hundred U.S. cities pledged to meet its targets.⁸⁵) The Kyoto Protocol was ratified by 141 other nations and took effect on February 16, 2005.

Despite its broad international acceptance, the Kyoto Protocol has not achieved its goals because some developed countries have not met their lowered emissions targets. And from its inception, a significant problem for the Kyoto Protocol was the exemption for developing countries. China, for example, has become an emissions titan; since the Kyoto Protocol was signed, China's emissions have nearly tripled and India's have doubled.⁸⁶ While some European countries have reduced their emissions in recent years, these reductions may be attributable to the global economic downturn and not necessarily connected with a deliberate shift in emissions strategies. The United States, which under the agreement was supposed to reduce its emissions 7 percent below 1990 levels by 2012, had, as of

2011, increased emissions by 8 percent since 1990, according to the EPA.⁸⁷ In 2011, Canada officially rejected the Kyoto Protocol, arguing that it was not working to impose limits on the two largest producers of greenhouse gases, the United States and China, and that there was no way to meet the Kyoto targets without serious economic dislocation in Canada.⁸⁸ Nevertheless, international negotiations to reduce greenhouse gas emissions continue. The most recent round of climate talks is aiming to create a new international agreement by 2015.

In addition to the negotiation of the Kyoto Protocol, various other global summits and meetings have been held in the twenty years since the original Earth Summit in Rio de Janeiro. The most recent was the Rio+20 Earth Summit, held in Rio de Janeiro in 2012. Global leaders, such as the UN Secretary General Ban Ki-moon and U.S. Secretary of State Hillary Clinton, declared the Rio+20 meeting a success for clarifying global aspirations for a sustainable future.⁸⁹ But environmentalists decried the meeting. The executive director of Greenpeace, Kumi Naidoo, criticized its lack of binding agreements and described it as a meeting full of “empty rhetoric and greenwash from world leaders.”⁹⁰

Such conflicts indicate the nature of the divide between those who want radical action to fix environmental problems and politicians and business leaders, who advocate a more cautious approach. At issue here is a substantial difference of opinion about fundamental values. On the one hand, people value the success of short-term business ventures. But on the other hand, long-term environmental sustainability is also important to human well-being—not to mention the well-being of animals, plants, and ecosystems. What is the extent of our obligation to curb emissions and preserve forests and other wilderness areas, especially in light of the fact that these efforts often have a negative effect on other human interests such as the ability of many people to make a living?

Global Justice and the Tragedy of the Commons

The preservation of the environment is a global issue. Although many problems are specific to certain areas of the world, others such as global

warming are shared in common. As we have noted, poor people in developing countries may be the most negatively impacted by climate change. However, just as in the developed world, many in developing countries are more concerned with economic growth and development than they are with the environment. In fact, some people in poor nations even view the environmentalist movement as an example of Western elitism (see the Ramachandra Guha reading below). Only wealthy Westerners, they suggest, can afford to preserve unchanged an environment or wilderness that the poor need to use and change in order to survive. From this perspective, poor people who are struggling to survive should not be asked to curtail their own development while citizens of affluent nations enjoy goods unobtainable in the poorer countries.

The concern for environmental justice, which we discussed previously, will tell us that we ought to consider social justice concerns as we deal with environmental issues. Is it fair that those in affluent nations are able to live comfortable lives, while generating a disproportionately large share of waste and pollution? Most environmentalists agree that a sustainable solution to current environmental crises will have to deal with remaining social inequalities across the globe. As we've seen, international agreements regulating greenhouse gases contain variances that attempt to accommodate the inequalities between developed and developing countries.

While alternative fuels, recycling, and other environmentally friendly technologies seem to offer promising solutions to our environmental problems, they do not address the problem of inequality and egoistic rationality. Those in the poorer parts of the world want to have the goods that those in the affluent nations have. And those in affluent countries do not want to give up their current standard of living. However, there are not enough resources available for everyone to enjoy the standard of living of an average American. One solution is to find ways for those in developing regions to raise living standards in ways that create minimal impact on the environment; economic growth that is environmentally sustainable is referred to as *sustainable development*. But those in the affluent countries cannot reasonably expect poorer nations to

do their part for the environment while the affluent countries fail to control their own growth and consumption. It might be necessary, in the name of global environmental justice, for affluent countries to radically scale back their level of consumption. Paul and Anne Ehrlich, influential demographers who have been warning about overpopulation for decades, warn: "if we fail to bring population growth and over-consumption under control, then we will inhabit a planet where life becomes increasingly untenable."⁹¹ The problem is not only that the human population has exceeded seven billion, but also that everyone wants to consume as much as the average American.

Who has a right to consume the world's resources? Issues surrounding resource consumption and allocation may make it impossible to create a stable system of global environmental justice. One concern is based upon claims about property rights and capitalism. According to this perspective, landowners have a natural right to develop the resources they possess. To maintain that certain landowners (or countries) should not develop their land or resources appears to be a violation of basic property rights. Furthermore, there is no guarantee that common areas not owned by anyone—the so-called "commons"—will be adequately protected. The oceans and the atmosphere are vast commons. Since they belong to no one, they are easy prey for exploitation and they are also used as vast sinks into which we flush our waste. The American ecologist Garrett Hardin warns that self-interested individuals will tend to take advantage of unprotected common areas, according to a concept that he calls "the tragedy of the commons." Hardin also points out the ethical challenge of global environmental justice in his discussion of what he calls "life-boat ethics." According to Hardin, we should imagine that we are each floating in an isolated lifeboat, competing with one another to survive. Our lifeboats have a limited carrying capacity, so our obligation is to take care of ourselves first—to manage our own resources. Hardin's perspective leaves us with a world of isolated nation-states, each struggling to survive as the growing human population continues to strain the earth's limited resources. Moreover, Hardin's tragic conclusion is that if this is the way we conceive the

world, we may not be able to fend off the collapse of the commons, since each of us will try to exploit what's left for our own benefit.⁹² This is a form of the prisoner's dilemma that results from egoism (as discussed in Chapter 4): as each pursues his own self-interest in a world of self-interested people, we may soon end up with unwanted outcomes.⁹³ From this perspective, which is firmly anthropocentric and even egocentric, the most rational short-term strategy may be to find ways to exploit the environment and enrich oneself before the true impact of the environmental crisis is upon us, to build up our reserves so that we can ride out the coming environmental storm.

This sort of short-term and self-interested reasoning is criticized by both anthropocentric and ecocentric environmentalists. Ecocentrists maintain that we have an obligation to the ecosystem not to overexploit it. Anthropocentrists point out that we have a humanitarian obligation to help others who are suffering, as well as an obligation to future generations to make sure we don't destroy the commons and overexploit the ecosystem. Both note that short-term self-interest can lead to disastrous consequences, as evidenced by "collapsed" or failed societies such as the Rapa Nui on Easter Island and the Maya in the Yucatán.⁹⁴ In each case, unsustainable growth led to the downfall of an entire civilization. Societies that collapse do so because they are unable to restrain their own development and unable to focus on the long-term sustainability of their practices. It may be that this is simply part of the natural cycle of life. Organisms grow, reproduce, and consume until they outstrip their resource base. When the resource base is overexploited, the population dies back. But the stakes are quite high now that environmental impacts have created truly global problems. And those who suffer the most from environmental degradation will be the most vulnerable among us. An environmental justice perspective will tell us that we have an obligation to protect those vulnerable people.

We have seen in this chapter that there are a variety of environmental problems confronting us today: from urban pollution to climate change. Some may view these problems from an anthropocentric perspective, focused on cost-benefit analysis or a concern for environmental justice. Others will

point toward a deeper set of ecocentric concerns that emphasize the intrinsic value of wilderness and natural systems. The ethical issues to be considered here are complex, as are the causes and possible solutions to environmental challenges.

In this chapter's first reading, William Baxter argues that anthropocentrism is the only possible approach to environmental questions and concludes that we should accept an "optimal" pollution level for human beings. In the second reading, Bill Devall and George Sessions explain the key elements of the non-anthropocentric approach of deep ecology. Finally, Ramachandra Guha raises questions about deep ecology from the perspectives of the developing world and Indian and German environmentalism.

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R E A D I N G

People or Penguins: The Case for Optimal Pollution

WILLIAM F. BAXTER

Study Questions

1. Why does Baxter believe that we should have clear goals in mind in order to answer moral questions about the environment and about pollution in particular?
2. What are the four criteria or goals that he suggests? In what ways are these people-oriented criteria?
3. Does he believe that people-oriented criteria will necessarily be bad for the penguins or other elements of our environment? Why or why not?
4. What are his objections to valuing penguins, for example, for their own sake, beyond their usefulness to human beings?
5. What problem does he raise for the belief that we ought to "respect the balance of nature"?
6. Why does he believe that there is no right level of pollution?
7. What is the difference, according to Baxter, between resources and costs? How are they related? Why does the cost of building a dam or controlling pollution involve trade-offs?

Start with the modest proposition that, in dealing with pollution, or indeed with any problem, it is helpful to know what one is attempting to accomplish. Agreement on how and whether to pursue a particular objective, such as pollution control, is not possible unless some more general objective has been identified and stated with reasonable precision. We talk loosely of having clean air and water, of preserving our wilderness areas, and so forth. But none of

these is a sufficiently general objective: each is more accurately viewed as a means rather than as an end.

With regard to clean air, for example, one may ask, "how clean?" and "what does clean mean?" It is even reasonable to ask, "why have clear air?" Each of these questions is an implicit demand that a more general community goal be stated—a goal sufficiently general in its scope and enjoying sufficiently general assent among the community of actors that such "why" questions no longer seem admissible with respect to that goal.

If, for example, one states as a goal the proposition that "every person should be free to do whatever he wishes in contexts where his actions do not interfere with the interests of other human beings," the speaker is unlikely to be met with a response of "why." The goal may be criticized as uncertain in its implications or difficult to implement, but it is so basic a tenet of our civilization—it reflects a cultural value so broadly shared, at least in the abstract—that the question "why" is seen as impertinent or imponderable or both.

I do not mean to suggest that everyone would agree with the "spheres of freedom" objective just stated. Still less do I mean to suggest that a society

From William F. Baxter, *People or Penguins: the case for Optimal Pollution* (New York: Columbia University Press, 1974). Copyright © 1974 Columbia University Press.