

There is little need to elaborate on the quite well-known fact that our physical environment around the world is being rapidly and perhaps irreparably damaged by intense and growing human depredations. This degradation of the environment is the product of four factors we have already discussed: rapid population growth, increasing wealth leading to increased per capita consumption, ever more sophisticated technology, and accelerating urbanization. These trends are all interrelated and in varying degree interdependent. They are all, furthermore, influenced and shaped in some degree by politics—by positions, policies, and decisions based on political considerations.

Concern with the environment and its relation to politics is not new. We have discussed, for example, concepts of environmental determinism, whose origins go back at least to Hippocrates and Aristotle. Ibn Khaldun, as we pointed out in Chapter 1, theorized about the effect of the environment on the political units of his time and the life cycle of the State. Montesquieu, Ratzel, Kjellén, and Huntington are only a few others who have followed in this tradition. Toynebee, Wittfogel, and the Sprouts have more recently developed less deterministic concepts of “the impress of the environment on politics,” as pointed out by

Kasperson and Minghi.* Study of “the impress of politics upon the environment” does not reach back nearly so far, but Ratzel and Huntington both recognized that it was important, and half a century ago Whiteley

examined it in some detail. Kasperson and Minghi suggest that a study of this kind of relationship might be organized into four major components: “political goals, agents of impress, processes and effects.” They also consider a third type of environment–politics relationship, “the public management of the environment.” Here they review some of the work on this subject by Barrows, Colby, White, Burton, and themselves, all during the twentieth century. They organize their discussion under three main headings—environmental policy and planning, resource allocations, and spatial linkages and area repercussion. These are most useful concepts and can help us understand the three types of relationships as we examine three aspects of the environment–politics linkage.

Ecology**

Before the mid-1960s, “ecology” was a word used commonly by geographers, biologists,

and other scientists but seldom heard or seen by the general public. Since then it has been adopted by a new generation concerned about rapid worldwide destruction of our planet’s environment. They have broadened and fortified the conservation movement and impressed the public with both the urgency and the practicality of protecting our physical environment from further destruction and actually reversing the trend and restoring the environment if possible to its original state. The euphoria and élan of the early days have largely disappeared, however, and the ecology movement has settled down into a persistent, dogged, and frequently successful battle against entrenched interests, rigid thinking, and obsolete laws. Heartening also has been the spread of the ecology movement from the United States to other countries.

In only one generation Americans have lived through an economy of scarcity during the Great Depression, an economy of abundance in the post-World War II period, and an economy of waste at present. Through it all they have never lost faith in the eternal bounty of nature and the virtue of exploiting it enthusiastically. Now we must shift gears and reverse all this, but every stage, every step involves a political struggle. In less than half a century we have experienced titanic battles in the Congress and the press over the Glen Canyon Dam (Arizona), the Dickey-Lincoln project (Maine), the Cross-Florida Barge Canal, the Central Arizona Project, the Alaska Pipeline, and dozens of other proposals, large and small, for modifying our physical environment, allegedly in order to improve our economic and perhaps social environment. We have come to expect government at all levels (but particularly the federal government) to subsidize projects of this nature, but we are still unwilling to accept their regulation and control by government. Worse, we have yet to develop a national consensus on environmental matters that can be expressed in a national plan or at least guidelines.

The Environmental Policy Act of 1970 was a landmark, a giant step in the right direction. It spelled out goals and policies to

guide all federal actions that would have an impact on the quality of our environment. It made a concern for environmental amenities and values a part of the mandate of every federal agency. It established the Council on Environmental Quality to identify the policy issues and alternatives for environmental administration. Finally, it required an annual report on the quality of the environment. This act was followed by other, more specialized legislation, such as the Clean Water Act and the Clean Air Act, all the products of diligent and persistent efforts of citizens individually and collectively working with—and on—legislators.

These have helped rectify two of the three basic problems that had prevented the federal government from playing an effective role in long-term environmental planning. When long-range planning has been undertaken, it has generally been intended to deal with problems posed by projected trends rather than to achieve desirable goals, and public policies too often have been defined and carried out in fragmented, narrow programs by mission-oriented agencies. Now there is somewhat more order in both setting and reaching goals, but there is still considerable scope for improvement, both in the planning and in the execution of plans. Both are made more difficult than necessary, however, by the failure so far to deal with a third basic problem: the fact that public administration in general is geared to annual appropriations that tend to favor short-term considerations.

It would be difficult indeed to find someone who would speak forcefully in favor of deliberately destroying our environment. Yet many argue in favor of postponing decisions on ecological problems or insist that they are not really so serious or that other problems should be attended to first or that we really cannot afford to protect wildlife or clean up streams or restore land eroded by careless farming practices or reduce noise pollution. In fact, all these arguments have some merit and it is unwise to ignore them. Since we cannot do everything first or well or at all, we must make choices. These choices are, in part, moral ones—but they are largely polit-

*Roger E. Kasperson and Julian V. Minghi, eds., *The Structure of Political Geography*, Chicago: Aldine, 1969, pp. 473–475.

**We prefer the term *ecology* to *environment* because ecology is the study of the mutual relations between organisms and their environment. When it becomes a public issue, however, or when linked with human activity, environment serves just as well, and we therefore use the terms more or less interchangeably.

ical. Decision making in these cases is always difficult.

The types of decisions to be made fall into three categories.

1. **Priorities of resource allocation.**

There is so much to be done. As abundant as our resources are, they are limited and must be distributed among the various tasks to be accomplished. Money, energy, talent, and time must be allocated on some basis other than simply greasing the squeaky wheels, yet we have not yet devised such a system.

2. **Distribution of costs.** We all recognize by now that nothing is free; everything costs, even clean water and air. But who is to pay for achieving and maintaining a livable environment? Ultimately, of course, we all pay for everything, but the real questions are whether we pay now or later; through higher taxes or higher prices; in cash or in kind, or simply by foregoing luxuries and reducing our consumption of material things; and, of course, who is to bear what proportion of the costs?

3. **Distribution of benefits.** Should the benefits of an improved environment be distributed evenly throughout the entire country, through all socioeconomic levels and among all ethnic groups? That would seem to be very democratic, but we may question whether it is practical or desirable. Should not special attention be given to the physically and mentally handicapped, to deprived minorities, to low-paid workers, to the unemployed? Should the wealthy get subsidized marinas and rural people beautiful parks?

Clearly, there are no easy answers to any of these questions. Two contemporary but long-standing problems may serve to illustrate these points.

Strip Mining

There are at present more than 3000 surface mines in the United States, spread widely across the midsection of the country from

the Appalachians to the Rockies, most of them coal mines and most of them relatively small. Until adoption of the federal Strip Mining Control Act of 1977, regulation of strip mining was largely left to the states. Long after the severe ecological damage of strip mining had been amply documented, its control was spotty and inadequate. Kentucky, the country's leading producer of strip-mined coal, provides a good example.*

Kentucky's efforts to control strip mining have followed a most peculiar course. The period 1947-1967 was marked by a continual increase in the strength and scope of the regulatory effort which culminated in a tremendous burst of initiative in the years 1965 and 1966. In that short span of time, the control program was vastly expanded and improved. Stringent and detailed administrative regulations were promulgated. A new strip mine control law, considered to be the toughest in the nation, was passed. Aggressive enforcement of both the regulations and the statute was undertaken. The available geological data for those years indicate that the improved control program actually achieved a palpable reduction in strip mine-related ecological damage.

The strip mine control program reached a peak of effectiveness in 1967. Then, just as the rest of the country was commencing a period of unprecedented concern for environmental quality, it entered a period of decline.

In this case, apparently neither pressure on the Kentucky political system by outside forces nor scandal or other crisis mobilizing public opinion was significant in achieving stricter controls. Rather, "the crucial political actor in the initiation of the program, as well as in its passage by the legislature and its successful implementation, was the Governor, Edward T. Breathitt." But his achievement did not survive his term of office: "The deterioration [in strip mine control] was the

result of the loss of political autonomy which resulted from electoral defeat suffered by the administration faction in 1967 and its subsequent failure to return to power in the gubernatorial election in 1971."

Because of the tenuous and uncertain nature of state control of strip mining, the Congress was finally persuaded, after decades of effort by ecologists and others, to pass federal legislation. There have been many reports of abuse and evasion of the 1977 Strip Mining Control Act, notably illegal strip mining on federal land. But rigorous enforcement of legislation requires not only money but also sufficient evidence to permit successful prosecution when necessary, and this is often difficult to obtain in regions where strip mining plays such an important role in the lives of people. The problems are likely to increase, not decrease, if demand for coal rises to compensate for shortfalls in petroleum supplies or problems with nuclear energy.

Water Projects

One of the traditions of American politics since the founding of the republic has been the regular congressional appropriations to support what were once termed "internal improvements," more recently referred to as "rivers and harbors projects" and informally known as "pork-barrel" legislation. In April 1977 President Carter, less than three months in office, decided to break with tradition and slashed more than \$7 billion worth of water projects from the budget. Despite the ample justification for most of these cuts on grounds of both economy and ecology, congressmen and senators from nearly all sections of the country raised a storm of protest. Their pet projects, those designed to benefit their constituents and win votes, were threatened, and they fought to protect them. In the end there was a compromise, and the president signed a bill that still provided over \$10 billion for public works, including some big and expensive projects he had opposed. The president and the public learned how hard it is to overcome local demands for federally financed "improvements."

A Brief Catalogue of Ecopolitical Woos

We do not have the space here to discuss in detail the manifold ecological problems of the planet, or even of the United States, that are caused or aggravated by politics. The problems are so numerous, complex, widespread, and intertwined that volumes would be necessary even to outline them properly. So here is a brief, random list of some current issues that are not particularly well publicized. They are presented in no particular order.

1. **Irrigation:** Irrigation agriculture has sustained civilization for thousands of years and is still vitally important for the subsistence of millions of people around the world. Yet in the United States it is not a matter of civilization or even of subsistence; it is a matter of luxury. We discussed some elements of this issue under the heading of public lands in Chapter 14, but the point warrants expansion here. Irrigation of rice fields in California and sugar cane fields in Florida is destroying the natural environment in order to provide crops heavily subsidized by the taxpayers that could be more cheaply imported to meet domestic needs. But Florida and California have large and growing congressional delegations that seem more interested in protecting the huge agribusiness complexes in their states than in protecting the consumer, the small farmer, the taxpayer, or the environment.

2. **Ocean fisheries:** During the 1970s some American commercial fishermen, chiefly those in New England and to a lesser extent in the Pacific Northwest, lobbied hard for a 200-mile exclusive fishing zone in order to be able to exclude foreign fishing fleets that they claimed were seriously depleting fish stocks. They won the legal battle but are losing the ecological and economic ones. Only 15 years after the president's proclamation of a 200-mile exclusive fisheries zone, several fish stocks were seriously depleted, many fishermen

were unable or unwilling to modernize their vessels and their techniques, and the United States had signed agreements with a number of countries allowing their fishermen to harvest stocks American fishermen cannot or do not wish to harvest.

3. **Waste disposal:** The disposal of the refuse of an economy based on waste has emerged as a major environmental, political, and social problem. We now have the spectacle of household garbage being trucked across the country or barged to Europe and Africa in a search for cheap, legal, and perhaps secret dump sites. Ocean dumping has been restricted for sound ecological reasons, and shooting garbage into outer space is not yet feasible, so we must find some terrestrial repositories. Toxic and radioactive wastes are even more difficult to manage. The most logical and the ecologically soundest method of dealing with the problem—produce less waste by reducing consumption—is considered un-American and is unlikely to be adopted very soon.

4. **Wetlands:** The biologically richest and most essential physical environments in the world are coastal wetlands, followed closely by inland wetlands. Yet the American propensity for living, working, and playing on or near water has drastically depleted the wetlands, perhaps past the point of no return. State and federal legislation to protect these fragile areas from the ravages of “developers” is hard won and easily lost. President Bush’s solution to the problem of competition between commercial and environmental concerns was announced on 9 August 1991: redefine “wetlands” so as to remove huge areas from potential federal protection and make them available for “development.”

5. **Wildlife:** The Alaska Native Claims Settlement Act of 1971 allocated to new native corporations large portions of the state. One of them, Old Harbor Native Corporation now faces destitution un-

less it can sell or lease its land to commercial interests to develop for logging camps and sawmills, hunting lodges, canneries, fishing camps, airstrips, and other activities. The people would like to sell their land, or most of it, back to the federal government, which does not want it. The problem is that their land is within the Kodiak National Wildlife Refuge, established in 1941 to protect the Kodiak bear, the largest land predator on earth, of which there are currently 2500 to 3000, as well as bald eagles and many other wild animals. This is a classic case of conflict between preservation of the environment and its destruction through commercial development, only here the Aleuts are caught in the middle. Similar problems are faced by indigenous peoples throughout North America and elsewhere.

6. **Feral animals:** In the western United States, especially in the Great Basin, large herds of wild horses and donkeys roam freely, protected since 1971 as “living symbols of the historic and pioneer spirit of the West.” The legislation was a product of a huge outcry of many conservation and animal-rights groups as well as the general public, who protested the mass slaughter of these feral animals whose numbers were far in excess of the carrying capacity of their environment. The result of the protection is that the number of horses alone has grown from about 35,000 to between 50,000 and 75,000. The “adopt-a-horse” and “adopt-a-donkey” programs haven’t worked, zoos don’t want the animals, the law protects them from the pet-food producers, and the Bureau of Land Management does not have the funds to manage them properly. So the feral animals drive away the native wildlife in the competition for scarce water and forage; even water just below the surface is being depleted, and erosion is being accelerated.

7. **Water:** Not only is improper and wasteful irrigation causing waterlogging and

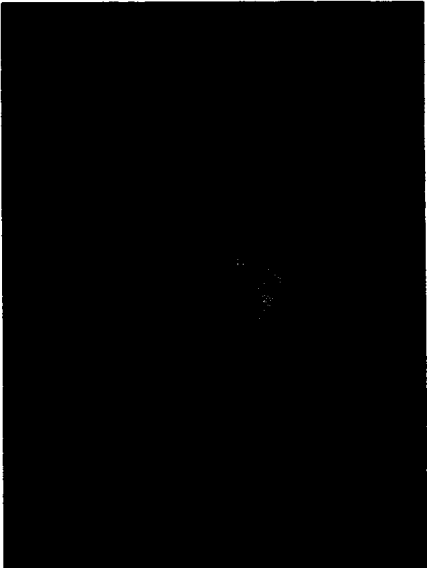
salinization of good agricultural land, but the runoff water is contaminated with chemical fertilizers, pesticides, and fungicides. The per capita consumption of water in the United States is the highest in the world, and consumption is increasing with increasing population, wealth, and water-using technology, at the same time as we are losing potable water to pollution from many sources. Again, the politically acceptable approach to the problem has been to spend more money on water treatment, recycling of wastewater, and other palliatives rather than to reduce per capita consumption of water in the first place. Logical, of course, but politically unacceptable at present.

The overall problem of managing the environment wisely is compounded in the United States by its federal system. Since the early 1980s the federal government has abdicated its leadership role in this area, and some states are beginning to step in as understudies. States, counties, and municipalities are regulating the emission of toxic chemicals into the air, requiring and regulating recycling programs, regulating the use of cancer-causing substances, strengthening liability rules for oil spills, controlling automobile emissions, modifying allocations of irrigation water, and so on. Some of these programs are innovative, and some are ef-

fective locally. Since the problems are regional, national, even global, however, even the best local programs in the long run will simply not be good enough. Political geographers could contribute substantially to the effort at all levels of government and among the general population as well as within the academy. But few have done so at this point.

Ecology in Other Countries

Concern with environmental matters has been manifested mostly among the educated and well-to-do. Poor people have other and higher priorities. The same is true of States. Generally, as we have pointed out in our discussion of marine pollution, the poorer countries of the world have only recently begun to realize that their environments are also in danger and that ecological damage may well cost more than industrial development will earn. All over the world, major development projects are being reexamined in light of new understanding of ecological principles. The Jonglei Canal project in Sudan and the Trans-Amazonian Highway in Brazil are examples. Even Egypt’s pride, the Aswan High Dam, completed only in 1970, has already caused so much ecological damage in the Nile Valley and the eastern Mediterranean that there is talk of dismantling it. But the destruction goes on: The large wild animals of East and Central Africa are rapidly being exterminated,



Ecology consciousness spreads to China. Even China is now ignoring Marxist doctrine to some extent and making some efforts to reduce environmental degradation. This billboard in a public park in Zhengzhou, Henan, reads: “Theme of World Environment Day 5 June 1989—Warning: The Globe is Getting Warmer.” It was erected by the Zhengzhou Environmental Protection Bureau. (Martin Glassner)

the forests of Southeast Asia are disappearing at a frightening rate, overirrigation continues to destroy cropland through salinization and waterlogging in North Africa and Southwest Asia, and soil erosion continues almost unchecked in the highlands of Latin America. It will be difficult to overcome the suspicion born of colonialism and foreign exploitation and convince the people in these regions that conservation is in their interest.

Even the Soviet Union began in the late 1970s to take action on environmental matters, turning slightly from its customary emphasis on heavy industry and massive development projects. In early 1979, the main governmental agency on the environment was upgraded to the status of a State committee and intensified a six-year-old program of cooperation with the United States in 11 major environmental areas, including air and water pollution and earthquake prediction. They issued a *Red Data Book* listing endangered species of plants and animals and began reducing chemical pollution, moving factories out of the central areas of major cities, removing sulfur emissions of hydroelectric plants, and in general demonstrating a serious commitment to ecology. Although we have no detailed information, we might suppose that the political infighting that led to this commitment was at least as brisk as in the United States.

The frightful devastation of the environment throughout Central and Eastern Europe and the Soviet Union became clear, however, only as their communist governments were crumbling. Newly organized nongovernmental organizations, newly liberated mass media, and newly unshackled scientists and other intellectuals began voicing loudly and documenting what hitherto they had only been able to conjecture and grumble about *sotto voce*. Now all of them are faced with daunting problems of restoring a reasonably acceptable degree of ecological sanity along with economic, social, and political sanity. We can hope that they will be successful—with considerable outside help—but we cannot be sure that any of them will not revert to *dirnenoshin* despair and decay.

Canada's Green Plan for a Healthy Environment was unveiled in December 1990. It contains more than 100 new proposals, policies, programs, and standards to clean up, protect, and enhance Canada's land, water, air, renewable resources, the Arctic, parks, and wildlife, and to reduce waste generation and energy use. This may be the world's most comprehensive national environmental plan. Much of it is based on the United Nations concept of sustainable development. Since the plan is the product of democratic give and take, however, it is full of compromises and really pleases no one. On the other hand, it is far more progressive than anything produced south of the border and has few determined opponents. We shall see how vigorously and effectively it is implemented.

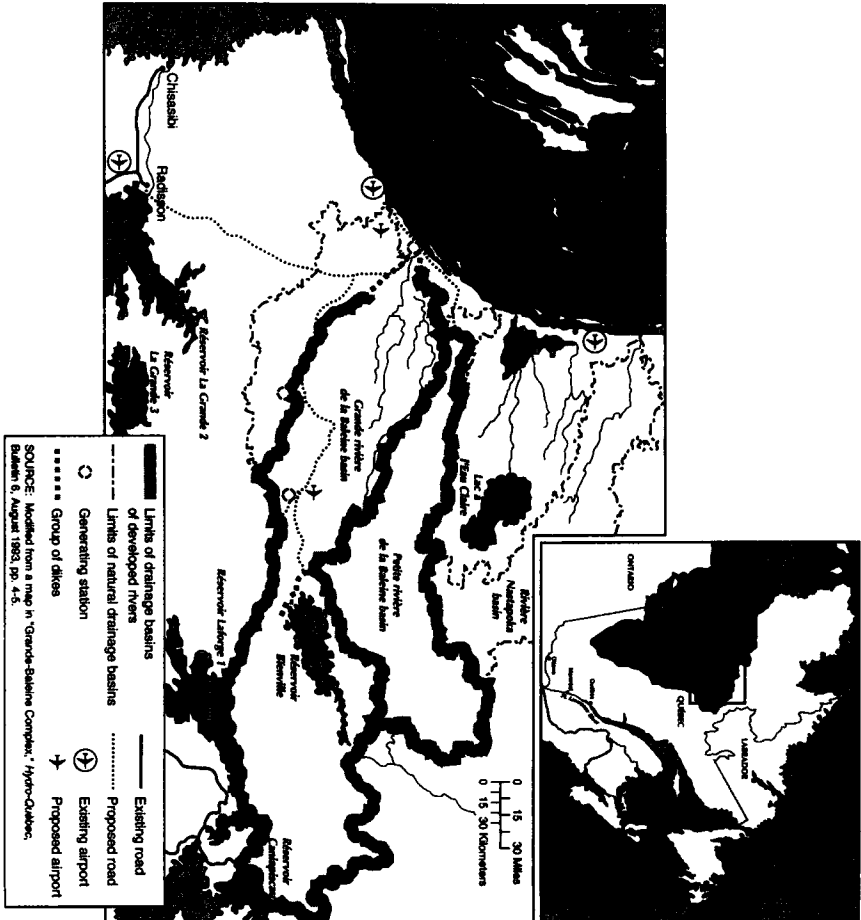
One hopeful sign may be the fate of the projected Grande Baleine (Great Whale) Complex, phase II of the massive James Bay Project. This scheme to dam the La Grande and other rivers flowing through northern Québec into southeastern Hudson Bay, including James Bay, was initiated by Hydro-Québec, one of Canada's largest corporations. In 1971 the Québec government created the Société d'Énergie de la Baie James, and construction got under way with little fanfare or opposition. Gradually, however, opposition began to grow, led by environmentalists and Cree Indian leaders. From the beginning, however, the project had the single-minded support of Robert Bourassa, Premier of Québec, and it became a major political issue in several elections. The opposition focused on the undoubted serious and varied environmental damage done by the dams, dikes, reservoirs, roads, airfields, and other facilities, and on the disruption of the traditional way of life of the Crees, Naskapis, and Inuit in the area. The supporters focused on the jobs created (mostly for Caucasians coming in from outside the area) and on the revenue from the sale of electricity (mostly to New York and New England). Politics won and James Bay I was completed by 1995.

Meanwhile, planning was going ahead for James Bay II, the Grand Baleine Complex to

the north of the original project. In 1988, when the Québec government announced that it would proceed with the project, it looked unstopable. Hydro-Québec had learned from experience that it had to be much more sophisticated in its public relations campaign, but so had the opposition. Hydro-Québec hoped that its initial support for the 1975 James Bay and Northern Québec Agreement and the subsequent Northeastern Québec Agreement (both discussed in Chapter 16) would calm the native peoples of the region and that the environmental impact sections of their own \$400 million feasibility study would calm everyone else. By this time, however, Canadians

generally and Québécois in particular had swung toward support of the concepts incorporated into the 1990 Green Plan, the Crees had become more united and politically powerful, and the Parti Québécois government of Premier Jacques Parizeau was not nearly as committed to James Bay as the Liberal government of Bourassa had been. On 18 November 1994 Premier Parizeau announced that the \$13 billion project was not a priority for his government and that it would not be constructed in the foreseeable future.

India has been building huge dams almost since independence, and generally they have been sources of pride. They have made



Canada's proposed Grande Baleine Complex.

available immense quantities of electric power and irrigation water, and have helped India's economic development keep pace with its rapidly growing population. Only recently have the environmental costs of these economic benefits begun to be considered. In 1989 there were popular protests against the Narmada Basin Plan to build 30 large, 135 medium, and more than 3000 small dams on the Narmada River and its tributaries. One of the outcomes of this project would be the world's largest man-made lake behind the planned Sardar Sarovar Dam. The lake would displace some 70,000 people in all, including many tribal people. The project, in Madhya Pradesh, is designed to benefit many people in Gujarat, Rajasthan, and Maharashtra as well. Opposition has been rising, however, as some experts are predicting "a major ecological calamity."

Africa's largest water diversion project and one of the largest public-works projects anywhere is under way now in Lesotho, the country that perforates South Africa. The Lesotho Highlands Water Project, initiated in 1986, involves building five major dams, hundreds of kilometers of highways and tunnels, and an underground hydroelectric power plant over a 30-year period. The purpose of this gigantic project is to provide massive amounts of electricity and irrigation water—largely for South Africa. Although it is being financed in part by the World Bank, the European Union, and the African Development Bank, much of the capital is coming from the South African government and private banks. The South African role generates controversy, of course, but so do the impending displacement of 20,000 people, potential erosion and sedimentation problems, endangered plants and wildlife, and the destruction of valuable archaeological sites. Although the project is being intensely monitored by ecologists and great efforts are being made to meet every objection, there is no assurance that the project will result in a net long-term gain for the people of Lesotho.

In Chile, the military dictatorship (1973–89) headed by General Augusto Pinochet essentially ignored environmental

Patricio Aylwin took over in 1990, a national debate began over environmental policy. As in most of Latin America, the debate swirled around two competing conceptualizations of "sustainable development," the concept formulated in 1987 by the Brundtland Commission (explained in more detail later in this chapter) and now underpinning all development efforts of the United Nations and of many other intergovernmental organizations, governments, and voluntary groups. Sustainable development requires programs designed to stimulate economic growth, promote social equity, and protect the environment.

The debate in Chile was about how to achieve these three goals. One of the two competing views held that rapid economic growth based on free market economic restructuring would in the nature of things eventually result in improved housing, health, education, and other basic needs that constitute social equity, and would also allow people, as they got richer, the luxury of concern about the environment. The alternative approach to sustainable development does not subordinate social equity and environmental quality to market-oriented economic growth. Rather, it considers that market-based growth historically has not, especially in developing countries, led to the other goals and that it is therefore necessary for government to assist the process through grass-roots development projects and local control over resources. It is a more holistic approach to development and emphasizes the linkages among all aspects of all three goals.

The debate was strongly influenced by a variety of internal and external factors, including the return to democracy, the entrenched power of the traditional elites, pressure from the United States and the World Bank to adopt environmental protection policies, the nature and role of the opposition during Chile's gradual transition to democracy (1983–89), the strengths and weaknesses of the responsible technocrats in the government, changing world market conditions and the need to attract investors. In the end, the comprehensive environ-

mental law enacted in March 1994 facilitates the market-oriented approach to sustainable development.

This does not mean, however, either that Chile is totally controlled by international capitalism or that it is headed for ecological disaster. It means that Chile has chosen, for the present at least, to build its development strategy on traditional foundations with less government involvement in the development process than the supporters of the alternative view had wanted. In addition, since Chile is a democracy, the alternative concept will still be expounded and will be able to influence decisions in many individual cases. The first effect of the legislation, however, was to cool the enthusiasm of the United States to have Chile join the North American Free Trade Area as the next step in creating a hemisphere-wide free trade area.

Energy

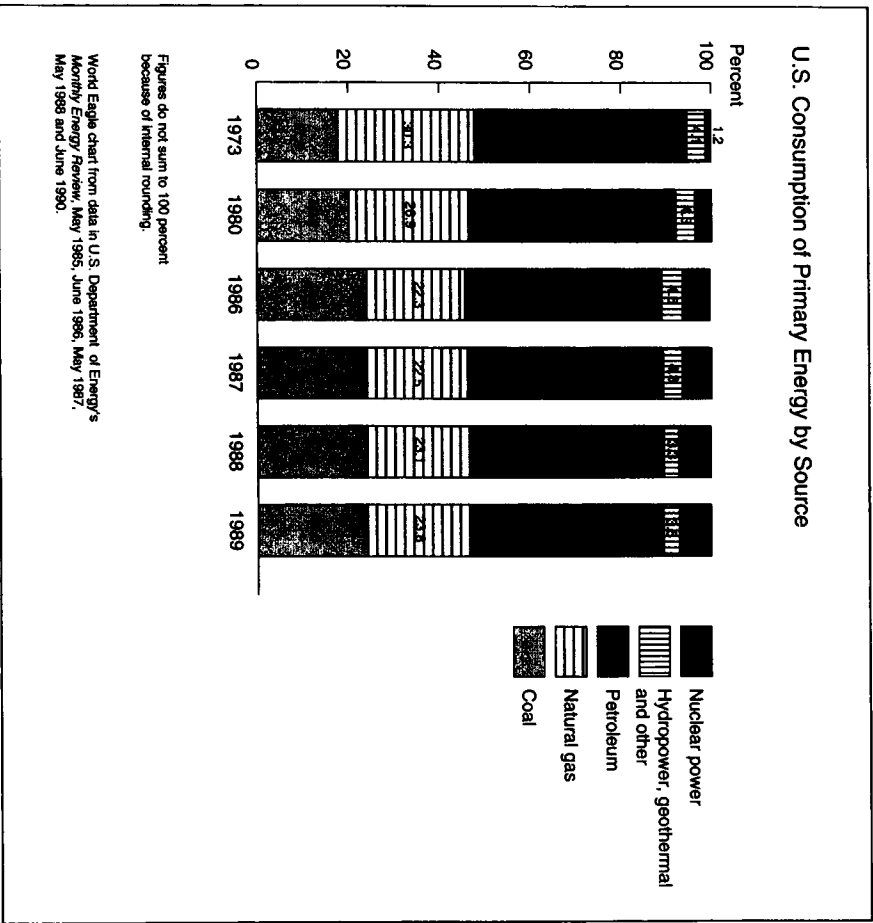
The "oil crisis" of 1973–74 suddenly and painfully brought to the attention of the American public what scholars, government officials, ecologists, and others had been saying for many years: that the supply of hydrocarbon fuels, although very large and still unknown, is limited, whereas demand generally rises at an accelerated rate; that the United States and other countries have become too dependent on such fuels; and that petroleum can be used as a political weapon. The spate of books and articles on the politics of oil that appeared during the 1950s and 1960s was suddenly engulfed by a flood of new analyses and exhortations. The result has been a new line of thinking, not only in the industrialized countries but around the world, and new plans of action to forestall another such "crisis."

For the first time Americans (and others) began thinking seriously about the total energy picture instead of isolated portions of it, about the folly of building a society based on the expectation of unlimited supplies of cheap energy, about the ease with which mighty States can be held hostage by a few countries poor in technology but rich in fuel.

The fall of the Shah of Iran early in 1979 generated another "oil shock" of falling stocks and rising prices. Suddenly, for the first time in memory, the U.S. government and even private industry were preaching energy conservation, investing heavily in alternative energy research, building up strategic petroleum reserves, and intensifying the search for new sources of petroleum within the United States, including the continental shelf—all in the name of "energy independence."

But then, as happens so often with commodities, the price of oil dropped on the world market, down to about half of the peak prices. Almost immediately, research on alternative energy sources was shut down, the search for new oil reserves was slowed almost to a halt, offshore oil rigs were laid up, promotion of conservation was left to the NGOs and to private firms that stood to gain from it, and Americans resumed building and buying larger automobiles and other motor vehicles. "Project Independence" went a-glimmering. American petroleum imports, which had fallen from a high of 46.5 percent of total supplies in 1977 to a low of 28.1 percent in 1982, began rising again until they reached 42.2 percent of total supplies in 1991 (a much larger total than in 1973, of course), and were still rising. A quarter of U.S. oil supplies, in fact, came from OPEC countries in 1990, compared with 17.3 percent in 1973.

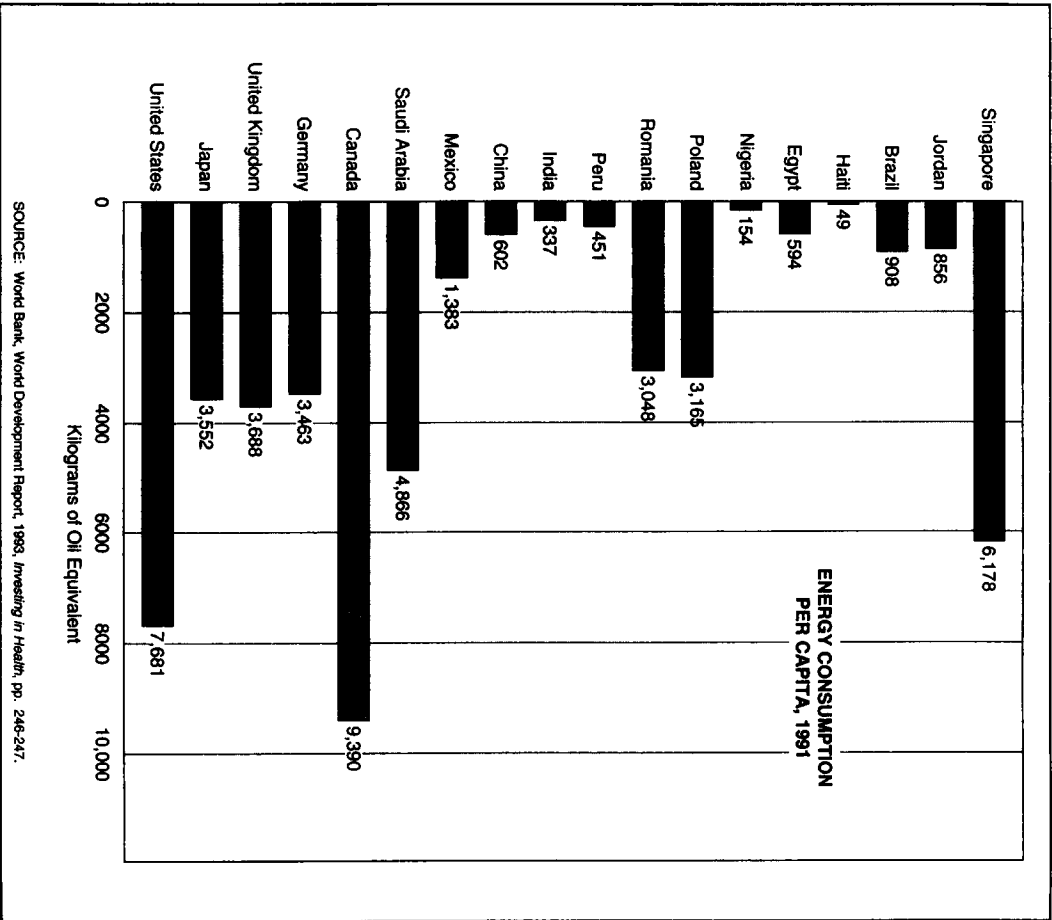
The bar graph shows the energy picture for the United States early in the 1990s. The most striking change from the 1973 picture is the considerable rise in the proportion of total U.S. energy derived from coal and nuclear fission, especially for the generation of electricity. Another is the actual drop in the proportion of energy derived from nonnuclear and nonfossil fuels. Geothermal energy, tidal power, wind power, wave power, ocean thermal energy conversion (OTEC), solar power—where are they? Hydroelectric power has dropped somewhat percentage-wise, and the "nonconventional" sources of energy have nearly vanished. So much for the American commitment to clean, renewable energy.



In the United States more than 90 percent of the natural gas and nearly 75 percent of the crude oil produced domestically come from only five states—Texas, Louisiana, Oklahoma, New Mexico, and Kansas. Despite the undoubted wealth and vaunted political power of the “oil lobby,” the fact remains that Americans still enjoy huge amounts of relatively cheap energy. It is clear, however, that this situation cannot last long; it is much too fragile. Difficult energy situations may well recur more frequently and more seriously until the country adopts and maintains a policy based on conservation of energy. We need an appropriate mix of fossil fuels, nuclear power, and such “unconventional”

sources of energy as the sun, wind, tides, geothermal steam, alcohol, and thermal layers in the sea, and we must have a rational means of paying for energy.

In addition, we must drastically reduce our overall per capita consumption of energy to something close to the world average. Considering our frightfully wasteful agricultural, manufacturing, transportation, and household uses of energy, this could be done sensibly without causing undue hardship for anyone. As for “energy independence,” it is a chimera. Avarity in energy is as foolish and impractical as it is in automobiles, textiles, consumer electronics, or nearly anything else. Real energy security

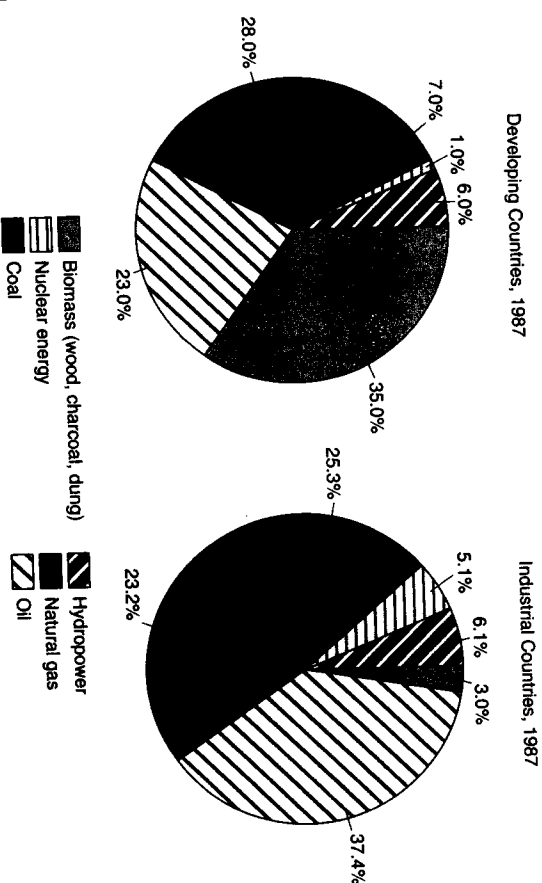


may well lie in international cooperation rather than competition. But other countries' energy pictures are not the same as ours, and both their goals and their policies will differ accordingly.

Western Europe, where the Industrial Revolution began, using first water power and then coal, is today much more dependent on external sources for its energy than the United States. Petroleum and natural gas under and around the North Sea have re-

lieved this situation somewhat, and still newer reserves in the form of tar sands in France and heavy crude under the Adriatic Sea may in the future be important, but the basic energy dependence of Western Europe remains unchanged. Consequently, nuclear energy is proportionately more important there than anywhere else in the world, nearly all the hydroelectric potential has been developed, and the world's only large-scale tidal power project functions in the es-

SOURCES OF ENERGY



SOURCE: The Environmental Data Book, The World Bank, 1983.

tuary of the Rance River in France. Nevertheless, Western Europe is still vulnerable to oil blackmail, and the OPEC oil embargo of 1973-74 did influence the policies of most States in the region (with the notable exception of The Netherlands) toward the Arab-Israeli dispute, though not necessarily to the extent hoped for by the Arabs.

Japan is even more vulnerable, having a much smaller domestic energy stock and no friendly neighbors on whom to call for assistance (nothing like the electricity intertie system binding most of the continental Western European countries, for example), and being located at the end of a very long oil supply line vulnerable itself to interdiction at a number of strategic points. Thus Japan, despite its close links with the United States, is forced to pay some deference to the political demands of its principal suppliers of petroleum while trying to develop new sources of

The developing countries present a more complex picture. Some are exporters of petroleum and members of OPEC, and therefore do not have to worry about sources of energy, at least for the short term. But as they invest their oil revenues in industrialization and modernization in general, they become more dependent on imports of oil in a manner of consumer and capital goods, technology, and skills obtainable only in the developed countries. At the same time their domestic energy needs grow, making a smaller proportion of production available for export (barring a sharp increase in production, which is unlikely because of the desire to conserve finite reserves). The result is likely to be decreased bargaining power and a restoration of something approaching a community of interests.

The non-oil-exporting developing countries still present a varied picture. Some—larger developed countries—consume so little

inanimate energy that for the present, at least, local supplies of wood, cow dung, agricultural wastes, coal, peat, and other traditional organic fuels are adequate to meet present needs. But these materials could also be used for fertilizers, chemicals, and industrial raw materials if other fuels were reliably available at reasonable prices, and cutting of trees for firewood and charcoal contributes substantially to the devastation of forests causing so much damage to the planet's environment.

Other countries are well along the road to industrialization and thus more energy-dependent than the poorest countries. Others have attained middle-class status, largely on the basis of the export of agricultural and nonfuel mineral commodities. Both of these groups of countries are hard-hit when oil prices rise steeply, but can get along because they have more financial resources of their own, better credit ratings, and more bargaining power than the poorest countries. Those most seriously affected are generally those whose infant industries, budding transport systems, and nascent urbanization are heavily dependent on foreign energy sources but whose economies cannot yet bear the new costs. These are the countries receiving the most aid from the United Nations, the OECD, and even some of the OPEC countries.*

A factor that must be considered, although it cannot yet be evaluated, is the entry of new suppliers of petroleum and natural gas into the market, none of which has joined OPEC. Mexico is already self-sufficient, has become an important exporter, and may have one of the world's largest oil reserves. Brazil, Vietnam, Egypt, and other developing countries may become important producers in the future, with inevitable though unpredictable political consequences.

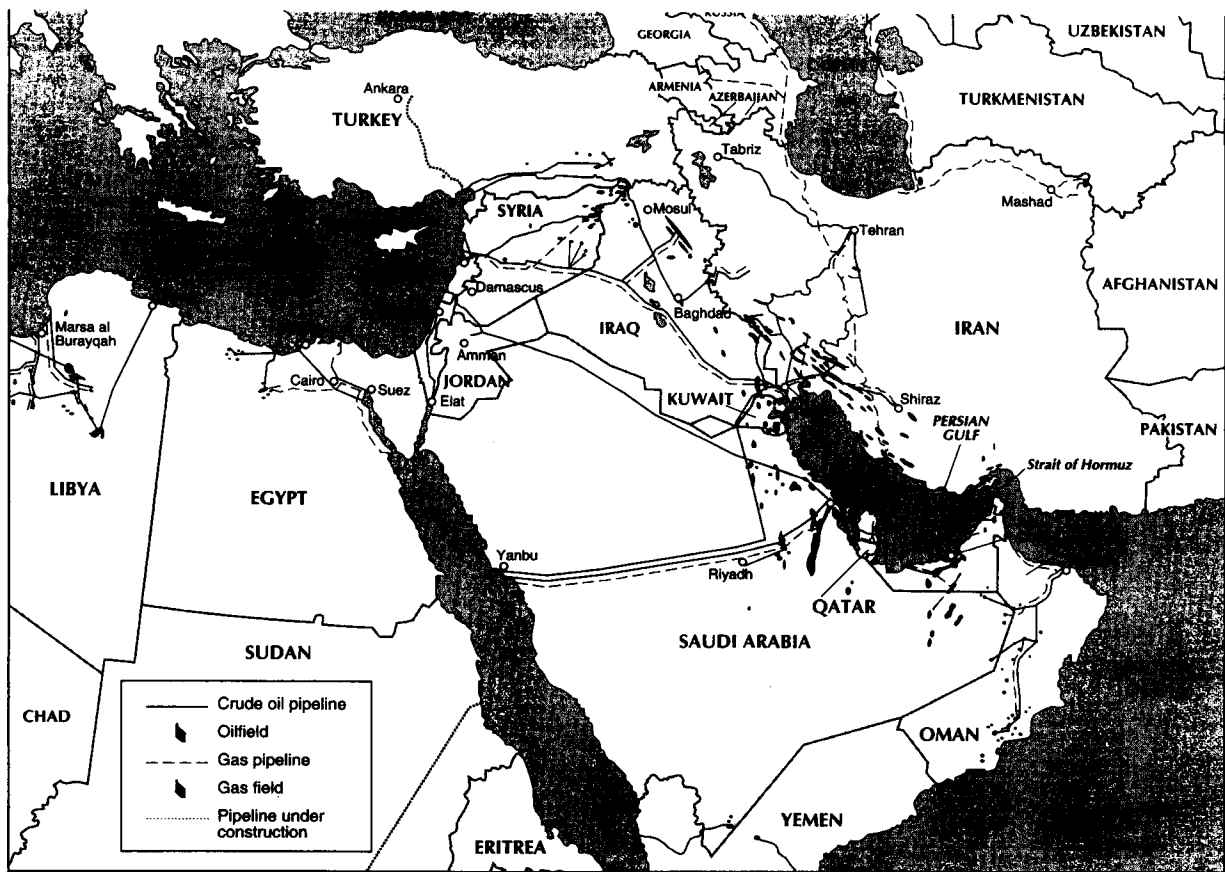
*Consumer countries have formed organizations to counterbalance OPEC. The International Energy Agency, composed of 20 major consumers, mostly OECD countries, and the Latin American Energy Organization are trying to work out programs to conserve petroleum, use petroleum more efficiently, and develop alternative energy sources. Their prospects for success are still uncertain.

We emphasize petroleum here because worldwide it is, and is likely to remain for a long time, the world's most important fuel and the most important fuel in international trade. Coal and natural gas seem unlikely to increase substantially in international trade, although of course locally they may well become more important. Nuclear energy, despite the reevaluation undertaken around the world following the nuclear power plant accident at Chernobyl in the Soviet Ukraine in April 1986, will very likely play a greater role in the world's energy picture than it does now—though probably less of a role than had been predicted two decades ago. One reason for the caution, of course, is concern over the safety of nuclear energy; another is the enormous increase in the capital costs of building nuclear facilities. But caution is also warranted by the uncertainties of nuclear power. Neither commercial-grade uranium nor advanced nuclear technology is as abundant or widespread as fossil fuels and the technology necessary to utilize them. The possibilities of nuclear blackmail are therefore at least as great for the suppliers of either the fuel or the technology.

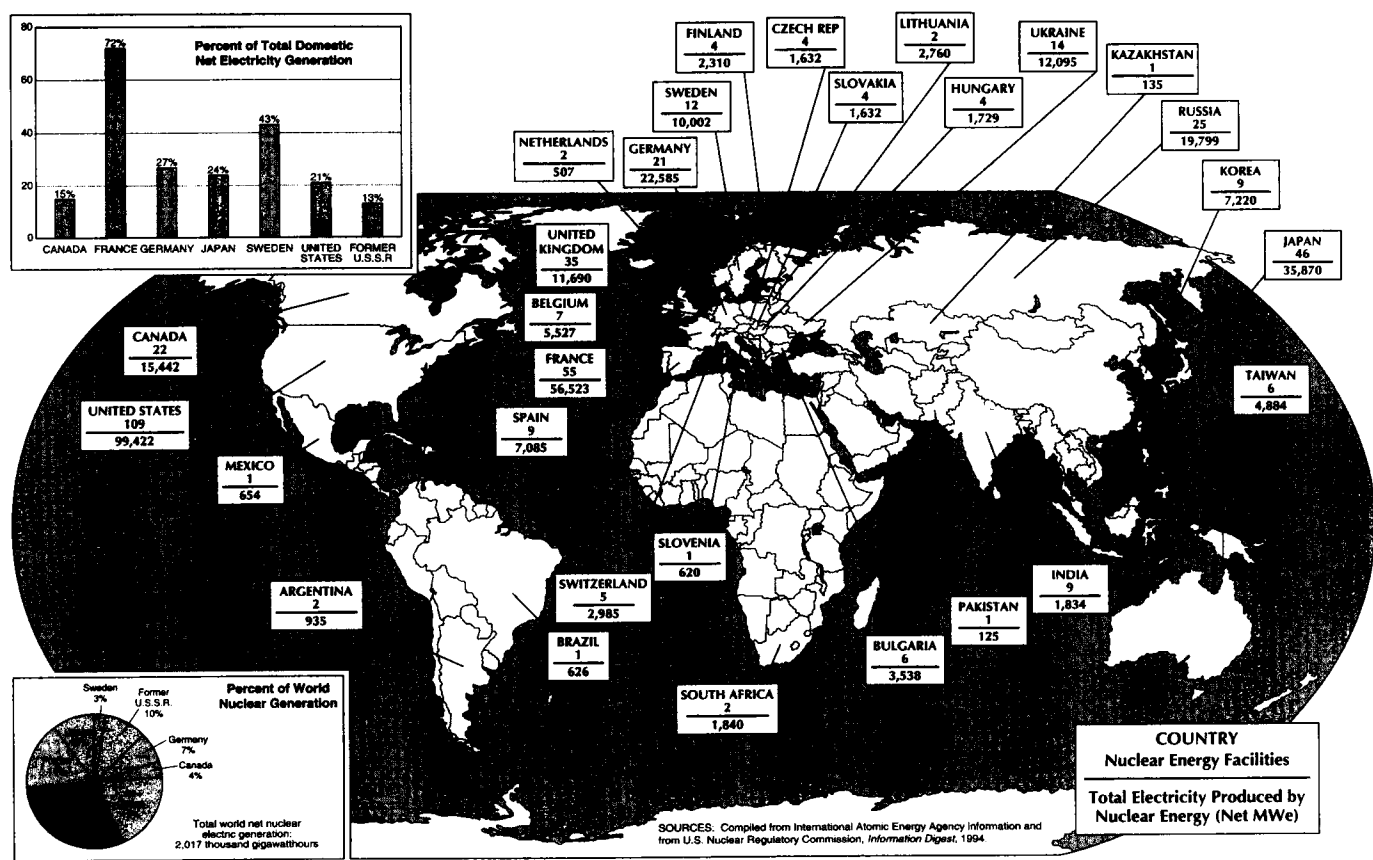
Here is still another example of the intricate interdependence of all the States and peoples of the world and of the need for worldwide cooperation rather than competition. The bar graph also shows the great disparities in consumption of energy in the world, another situation calling for cooperation.

Land Use

Increasing population is putting severe pressure on another finite resource: land. Land ownership and use have been matters of concern and study in many parts of the world for a long time, but have never been more important than right now. At all levels, from the individual house lot to whole countries and regions, they present problems so difficult that at times one despairs of trying to solve them. They can be solved, probably, but not very soon and probably not very satisfactorily.



Petroleum and natural gas in the Middle East. The world's largest reserves of oil and gas are shown on this map. Their political and economic importance in the contemporary world can hardly be exaggerated. The Arab oil embargo and OPEC's quadrupling of the price of oil in 1973-74, a second "oil crisis" following the Iranian Revolution in 1979, the Iran-Iraq War (1980-1988), and the Iraqi invasion and occupation of Kuwait in 1990 followed by the Gulf War between Iraq and a large coalition of disparate countries in 1991 are only the most dramatic illustrations of the reserves' geopolitical importance, and



Worldwide nuclear generation of electricity. Despite the accidents at Three Mile Island and Chernobyl, the world is not likely to abandon the use of nuclear fission to produce electricity until a more satisfactory method is developed, probably not until well into the twenty-first century. In 1993, there were 419 nuclear energy plants in use around the world. The United States generated about 31 percent of the world's total nuclear energy, and France about 16 percent. Since 1983, the average annual gross percentage factor has increased 17 percent in the United States and 7 percent in France.

Zoning

One of the most interesting examples of conflicts over land use, and one attracting the attention of some geographers, is that of local zoning. Systematic land zoning within urban areas of the United States dates only from 1916, and even today many urbanizing areas have only rudimentary zoning systems or none at all. In some areas where urban sprawl has become a serious problem, the old zoning regulations have proven inadequate to cope with new situations. Suburbanization has tended to rob central cities of their centrality, thus undercutting the fundamental premise on which zoning was originally based. Now suburbs are themselves becoming central cities, surrounded not by other suburbs but by other central cities. The long-term implications of the suburbanization of the hinterland and the urbanization of suburbia are unforeseeable, though we have already referred to some of them in our chapters on civil divisions and special purpose districts. Here we can only introduce some specific problems relating to zoning in urban and suburban areas.

The concept of zoning is based on the notion that society in general and most individuals benefit from the separation of various types of land use, generally divided into industrial, business, and residential, and subdivided further according to local perceptions. Those who have lived in countries where zoning is unknown or rare, however, and have been able to live in quiet, charming neighborhoods within easy walking distance of employment, shopping, and services, all of which are sprinkled throughout the city rather than confined to particular zones, may question the validity of this basic concept.

More serious from a political standpoint are the social effects of zoning. One of the popular ideas of the 1920s, when zoning spread rapidly across the country, was that cities should be surrounded by "garden cities," spacious, quiet, neighborhoods, green with vegetation surrounding single-family homes on large lots facing broad and sometimes delightfully curved streets. This "ideal" suburban community has had distinct advantages for

those who live in them and has provided some needed relief from the "asphalt jungle" of the city. But it has created some problems as well. For one thing, as whites became more affluent and moved into these suburbs, they tended to be replaced by blacks, Chicanos, Puerto Ricans, and other minorities, leading to patterns of black cities surrounded by white suburbs. Zoning that includes minimum lot sizes of 1 or 2 acres, prohibits multifamily dwellings, severely restricts the location of businesses providing goods and services, and provides other benefits for the well-to-do family with more automobiles than children has had the effect of keeping the minorities bottled up in the cities with little opportunity to follow the whites out to the suburbs, even when they acquire the inclination and means to do so. Environmental zoning can become, by design or chance, exclusionary zoning.

Another effect of the insistence on low-density suburbs has been the acceleration of urban sprawl, with huge areas of often productive farmland given over to subdivisions. The ecological effects of urban sprawl are at least as serious as the social and political ones. Most states by now have adopted some laws protecting open spaces around cities from the ravages of the "developers," but such laws drive up the price of developable land, deprive municipalities of additional revenue-producing land, intensify traffic congestion in the urban areas, and have other undesirable side effects. This is not to say that it is wrong to insist on green belts around cities, only that better planning is necessary to permit them to perform effectively the tasks for which they are designed.

Another type of zoning that is beginning to be taken more seriously is hazard zoning, that is, prohibition or regulation of land use in areas subject to frequent natural hazards. So far this has been used mainly to exclude residences, businesses, and most industries from floodplains (clearly a public good), but there are still many problems with such zoning even where it is in force. We still have, moreover, virtually no zoning for areas subjected to other natural hazards. An example of the need for such zoning is provided by the Los Angeles area. It has become fashion-



The politics of land use. This dramatic satellite photograph of the border area of Alberta (top) and Montana shows clearly the effects of an international boundary on land use in an environmentally homogeneous region. Because of different governmental agricultural policies, grazing is the dominant economic activity on the Canadian side and wheat farming on the American side of the 49th parallel. (Courtesy Geometrics Canada)

able since World War II to build homes on the slopes of the canyons in the Santa Monica Mountains and the Hollywood Hills in the northern part of the city and in other nearby areas. Nearly every summer and fall the drought dries up the grass and brush cover that is then set afire by natural or human action. Powerful winds spread the fires through the canyons, endangering and even destroying houses. Then, with the vegetation cover removed, the slopes generate massive floods and mudslides during the winter and spring rains, endangering and even destroying still more houses. The hazards are well known, yet the taxpayers are annually called upon to provide emergency services for people who insist on living in these hazardous areas. Similar examples abound in various physical environments around the country.

A still larger problem is one that has been scarcely, if ever, mentioned publicly. It can be bluntly summarized in a single question: How long will it be before we begin to re-

strict the occupation of desert areas that require enormous expenditures of public funds for water, roads, power, and other facilities to make them habitable, to say nothing of the effects of large-scale human habitation and public works on fragile desert ecosystems? Zoning of this type on a national scale might seem unthinkable now, but in fact there is ample precedent for it.

Land Reform

Contrary to the situation in the United States, it is private, not public, land ownership that is controversial in many other countries. During the eighteenth and nineteenth centuries and well into the twentieth, the dominant form of land tenure throughout Latin America, North Africa, Southern and Eastern Europe, and most of Asia was the *latifundio*, the large family-owned estate known by a variety of local names, of which the most

common is *hacienda*. Under the *latifundia* system, a large proportion of the land is owned by a very small percentage of the people. Before the 1789 revolution in France, for example, 40 percent of the land was owned by only 3 percent of the people. In Bolivia 10 percent of the farmers owned nearly 95 percent of the land in 1950. In industrial, urbanized societies, these figures might not be alarming, but in a traditional society in which land plays such a great role in the lives of people, they are serious indeed.

Land reform has been an essential prelude to, or component of, every important economic and social revolution in recent history. Land reform in Japan before industrialization began generated a doubling of agricultural production between 1870 and 1914. Similar increases in both agricultural production and farmers' incomes have followed (after an interval of disorganization and uncertainty) the revolutions of 1910 in Mexico and 1952 in Bolivia. Land reform has been fundamental in the programs of all communist governments and of many democratic governments as well. In fact, it has been amply demonstrated that *latifundismo* retards economic and social progress, while more equitable distribution of land encourages them.

Maldistribution of land also inhibits political democracy. Quite commonly, the large landowners are aligned with the local and national military and religious authorities to form a triumvirate that controls the State. Each reinforces and protects the other two. (See Chapter 20.) This is the major reason why meaningful land reform is so difficult to initiate and sustain without a violent or at least radical revolution. Where it has been attempted peacefully, as in Venezuela, the process does not seem to be so effective. In Venezuela, from the initiation of serious land reform in 1960 to 1973, 75 percent of the land redistributed came from the public domain; only about 12 percent of the country's private estate land had been affected. But land reform began in Venezuela when economic development, fueled by oil money, had already begun and only a third of the labor force was in agriculture. Expropriated lands were paid for generously, again out of

oil revenues, and after a brief early period of expropriation of private land, the reform evolved into what is essentially a colonization program. These three factors—redistribution of public lands, small agricultural space, and the colonization program—together permitted an increase in agricultural production as part of overall economic development under a stable democratic system, but these three factors are seldom present together. Furthermore, there are still grave imbalances and inequities in the country's socioeconomic picture. The country's rate of economic development slowed considerably after the drop in oil prices, and its former political stability has been seriously disrupted. Perhaps real land reform could have mitigated the damage of falling oil prices and helped to maintain political stability.

Land reform is not enough, however. Agricultural production cannot be increased and social inequities redressed without comprehensive programs of *agrarian reform* and *rural development*. These include such things as access to, and better utilization of, land, water, forests, and other natural resources; the development of a rural infrastructure, including electric power, farm-to-market roads, storage and transport facilities, irrigation and drainage projects, pure water, schools, and medical facilities; provision of agricultural inputs (such as seeds, fertilizers, pesticides, and machinery), crop insurance, and extension training; development of nongricultural activities in rural areas; and greater participation of rural people, especially women, in rural development. All this costs money, takes time, and requires a reordering of political priorities. And it inevitably has profound and often unpredictable political consequences. Yet in the long run, it is not only desirable but essential to have such agrarian reform and rural development if even the roughly 1 billion rural people in the world today living below an absolute poverty line of \$200 per capita income per year are to experience any betterment of their condition (to say nothing of the hundreds of millions who will be joining them in the next generation).

International Environmental Problems

The most important lesson to be learned from our experience with ecology, energy, and land use has yet to be learned by mankind as a whole: that the planet Earth and its atmosphere constitutes one unified ecosystem and that damage to any part of it inevitably results in damage to the whole. Everything is connected to everything else. Statesmen rarely give much thought to the long-range environmental consequences of their decisions and actions, and politicians do so even more rarely. Even though, as we pointed out earlier, an environmental consciousness has begun to spread around the world, it has not spread far enough or fast enough. Pollution, for example, knows no boundaries, yet there is still no adequate mechanism for preventing, containing, or reversing pollution at the international level.

The nearest thing to a global environmental agency is the United Nations Environment Programme (UNEP), with headquarters in Nairobi. Its Oceans and Coastal Areas Programme has generated and coordinated environmental protection and cleanup activities in designated portions of the global sea. Its Mediterranean Action Plan has had considerable success in cleaning up the Mediterranean Sea, one of the most polluted large bodies of water in the world. Progress has also been made in the Baltic, where the problem is at least as serious. Other international and regional organizations have expressed interest in environmental matters, but seldom do they rank very high on their priority lists. Even the World Bank has come under heavy fire for ignoring ecological considerations when funding huge infrastructure projects in developing countries, and it is beginning to reorder its priorities as a result. Some measure of the Bank's conversion to environmental protection is its expenditure of \$1.6 billion on it in fiscal 1991, compared with \$404 million the year before and almost nothing in previous years.

Meanwhile, agricultural pesticides applied in the rich countries of the Northern Hemisphere wash down rivers into the global sea

and eventually end up in the bodies of penguins in Antarctica. Acid precipitation caused by the mixing of atmospheric water with airborne industrial and automotive pollutants is devastating lakes and forests in North America and northern and central Europe and is threatening farms and monuments in India, Mexico, Indonesia, Zambia, Brazil, and other developing countries.

Industrialized countries in Western Europe were sending 10,000 to 20,000 shipments of hazardous wastes every year to Eastern Europe for disposal and were seeking disposal sites in developing countries until such practices came under the strict control provisions of the 1989 Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal. In 1994, 64 parties to this convention agreed that such shipments from OECD members to nonmembers will be completely banned by the end of 1997; however, the practice continues on a reduced scale.

The threat of major worldwide climate change, usually expressed as "global warming," is growing, with all of its ramifications, such as desiccation of agricultural areas and rising sea level as glaciers and icecaps melt. The depletion of the ozone layer in the upper atmosphere, which protects the planet from excessive ultraviolet radiation from outer space, is another global problem. So is deforestation, the rapid disappearance of the forests that once blanketed much of the earth and that provide much of our atmospheric oxygen as well as wildlife habitat, watershed protection, sustenance for soil, and regenerative forest products. This is one of the factors contributing to desertification, the spreading of deserts, particularly in Africa, over land that had been at least steppe and even savanna.*

*Although the nature, causes, and even existence of desertification are challenged by some scientists, most governments consider it a genuine problem. In 1977 the UN Conference on Desertification was held in Nairobi, and the UN Conference on Environment and Development (Rio de Janeiro, 1992) called for a UN Convention on Desertification which was negotiated subsequently and opened for signature in October 1994.

All of these intensify the pressure on finite global supplies of fresh water, which is rapidly becoming so scarce a commodity in much of the world that serious consideration is being given to towing icebergs from the Southern Ocean to coastal deserts, as has already been done experimentally. Another result of both natural forces and especially man's activities is the rapid extinction of species of plants and animals. Who can tell how many potential sources of food, medicine, pest control, beauty, and spiritual joy have been lost in this way?

The political and social consequences of this degradation of the global environment are incalculable. We are already experiencing growing, not diminishing, hunger and malnutrition in the world and huge waves of environmental refugees fleeing drought, floods, famine, destruction of the land, and other ecological problems. The possibility looms of resource wars, water wars, food wars, even land wars, just as we used to have before ideology became the chief rationalization for war.

All of this, of course, both stems from and reinforces the maldistribution of both wealth and power in the world, generated in part by the Industrial Revolution and in part by the staggering growth of the world's population that results in part from the Industrial Revolution. All these points are discussed in greater detail elsewhere in this book, but here they are seen in a broader context. Another point that bears repetition: Although at the present stage of world history populations are growing most rapidly in the poorest countries, it is likely that the greatest environmental damage is caused by the rich countries and their agents in the poor countries. Furthermore, it is in the rich countries that industrial and urban pollution is greatest.

Western Europe, for example, rich, sophisticated, and proud, was caught completely off guard in November 1986 when a series of accidental spills of toxic chemicals in Switzerland flowed down the Rhine River, killing hundreds of thousands of fish, contaminating drinking water for millions of people, and otherwise damaging the environ-

ment of four countries. This calamity called to mind the words of the English Romantic poet Samuel Taylor Coleridge:

The river Rhine, it is well known,
Doth wash your city of Cologne;
But tell me, nymphs, what power divine
Shall henceforth wash the river Rhine?

What power indeed? Perhaps some global plan of action—backed by a worldwide consensus, determination, sustained effort, and plenty of cash—will emerge as a result of the 1987 report of the World Commission on Environment and Development. This commission, composed of 23 people from all parts of the world and headed by Gro Harlem Brundtland, prime minister of Norway, was created by the United Nations but was independent of it. It labored for three years before issuing its massive report on an enormous range of contemporary world problems. Its recommendations, if followed urgently and faithfully, would certainly result in a better world for all of us.

Since release of the Brundtland report, a number of specialized international conferences have been held to discuss some of the global environmental problems listed above. Each has generated serious activity, including international conventions that bind their parties to specific actions to help reverse the destruction of our environment. It is doubtful, however, if, even after the end of the Cold War, there is yet the political will outside a few small countries to take the difficult and costly actions necessary to achieve the goal laid out by the Brundtland Commission: *sustainable* economic and social progress in an environmentally healthy world.

There are some signs of hope, other than the governmental efforts described already. One sign is the growing effectiveness of environmental NGOs around the world. The moratorium on whaling, the ban on large-scale driftnet fishing, the outlawing of chlorofluorocarbons discharged into the atmosphere, and many other small victories can be credited at least in part to their efforts. A creative and potentially important arrangement advocated by environmental NGOs is

that of forging portions of a developing country's foreign debt if it dedicates areas in the country as biosphere reserves or other types of protected parks or reserves. This "debt-for-nature swap" has great potential to accomplish a number of environmental and developmental objectives at once—if it is administered wisely, on a large enough scale, and over a long enough period of time.

Early experience with this arrangement, however, is not encouraging. In the words of a recent GAO report,

From 1987 through 1990, 13 countries completed 26 debt swaps. These swaps retired debts totaling about \$126 million (less than one-twentieth of 1 percent of the countries' external debt and less than one-fifth of one percent of their commercial debt.) Of the \$126 million, \$86.4 million was exchanged by Costa Rica. Fifteen swaps for nature accounted for nearly 90 percent of the \$126 million, while 11 swaps for development accounted for about 10 percent.*

Another sign of hope is the "greening" of politics at the local and national level, which may eventually spread to the international level. "Green" parties were organized in a number of European countries in the 1970s and 1980s to contest elections on environmentalist platforms. They have had some success in some countries, but so far have not really caught on elsewhere. Single-issue parties such as this can only be successful in electoral systems based on proportional representation, and even there the system places limits on what they can accomplish. If they try to broaden their appeal and win more votes, either by incorporating other planks in their platform or forging alliances with other parties with different programs, then they automatically dilute both their message and their energy, possibly to the detriment of both the parties and the environmental movement. It is a classic dilemma in politics, and it has no simple solution.

Nevertheless, formal, legal political activity has both publicized and legitimated the notion of environmental protection, and this has demonstrably influenced some national policies.

Perhaps the crucial test not only of the concept of linking economic development and environmental protection but also of international action as a means to bring it about is the United Nations Conference on Environment and Development (Rio de Janeiro, 1–12 June 1992). This conference, scheduled just 20 years after the United Nations Conference on the Human Environment in Stockholm, was voted by the General Assembly in 1989 and preparations for it began almost immediately. Countries were represented by heads of State or government; it was the largest "summit" meeting held to date. Another unique feature of the conference was the full and active participation of both nongovernmental organizations and private-sector interests. The scope, magnitude, and pioneering nature of this conference were breathtaking. It was certainly the most important conference since UNCLOS III and perhaps the most important since the San Francisco conference in 1945 that established the United Nations. Its true significance, however, will not be measurable for years—perhaps even decades—for the real measure was not what was said or done in Rio but how the resolutions, declarations, plans, treaties, and other documents that emanated from it are interpreted and implemented afterward. We shall see.

Conflicts in Ecology, Energy, and Land Use

In this chapter we have pointed out a number of problems relating to environmental politics from the urban neighborhood to the global one. Each is difficult enough in itself, but their interrelatedness compounds the complexity. Here we suggest a few interrelationships only to illustrate the point.

1. In the rush to "energy independence," we are considering a return to coal as a primary fuel because it is domesti-

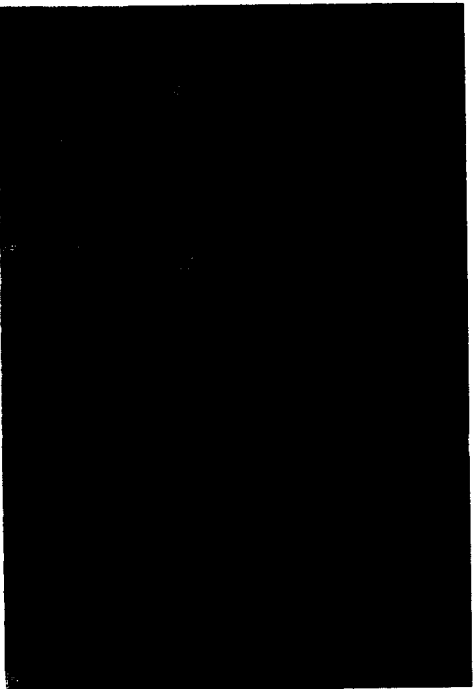
*United States General Accounting Office, *Developing Country Debt: Debt Swaps for Development and Nature Provide Little Debt Relief* (Washington, D.C., December 1991, pp. 1–2).

cally abundant, but we forget the reasons that we converted from coal to oil and gas in the first place: Coal is bulky and dirty, and, except for expensive anthracite, not very efficient. Underground coal mining, moreover, is hazardous and unhealthy, while surface mining is ecologically ruinous.

- 2. Expansion of the land under cultivation to increase food production means in most of the world using marginal or submarginal land, which would require a great deal of energy and can have most unfortunate ecological consequences.
- 3. Dispersal of industry to improve the urban environment and provide rural

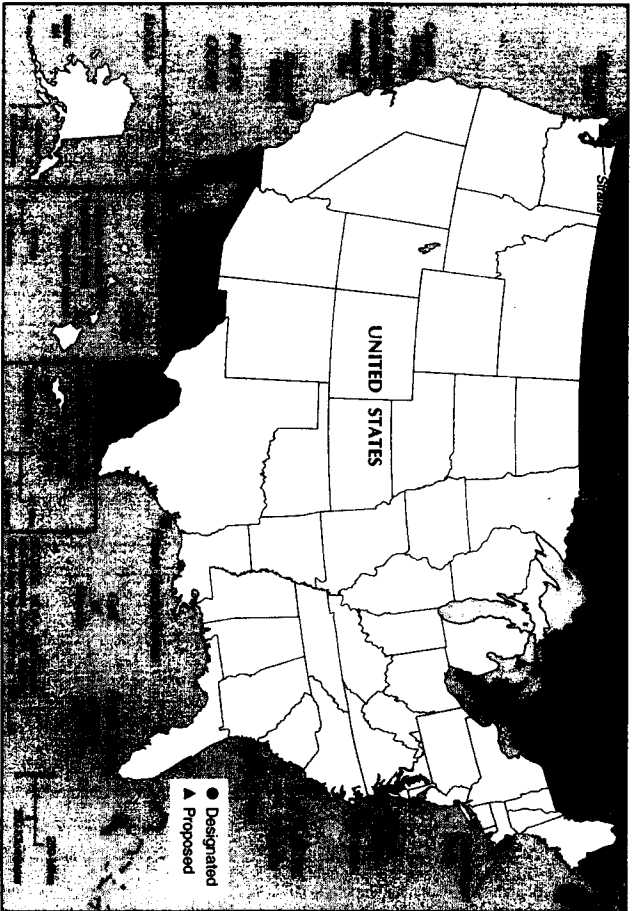
employment can simply accelerate urban sprawl, increase transport costs and energy consumption, and transfer the less desirable features of industry to rural areas, making these areas less attractive than they are now.

- 4. An increase in energy consumption means additional pipelines through fragile environments, oil spills, and blowouts; unsightly and perhaps dangerous electricity transmission lines; more rail, road, and water transport, requiring more energy and raw materials to produce and operate; uncertainties about nuclear energy; and changes in the composition of the earth's atmosphere.



A small portion of a large petroleum refinery. This is the desulfurization unit of the huge Texaco refinery in Convent, Louisiana. The immense complexity and capital cost of a large modern refinery preclude such installations in poor countries without external assistance in the form of capital, technology, equipment, management, or some combination of these elements provided by transnational corporations, international organizations, governments of rich countries or some combination of these sources. Petroleum refineries generally employ relatively few workers, since in order to be efficient and profitable, they must be highly automated. They pose serious environmental problems in the form of emission of noxious gases and toxic effluents, besides the ever-present dangers of oil spills and fires. They provide raw materials for a great variety of petrochemicals which have become important to both producers and consumers in modern industrial societies and in poor agricultural societies alike. They are therefore good candidates for vertical integration as the core of a modern sector of a traditional country. (Photo courtesy of Texaco and the American Petroleum Institute)

- 5. Increased raising of livestock for food means increased competition with wildlife for forage and destruction of their habitats.
- 6. Landfills in urban areas or even for offshore facilities, such as airports and oil terminals, can have adverse effects on the ecology of the coastal zone.
- 7. Economic development, considered a desirable political goal, inevitably requires intensified land use, ever-increasing energy supplies, and ecological damage.
- 8. Hydroelectric dams, which generate nonpolluting energy at relatively low cost, can interfere with the migrations of anadromous and catadromous fish, cause siltation behind the dam and desiccate wetlands below it, and devastate the land and culture of nearby indigenous peoples.
- 9. The readily accessible fossil fuels have already been found; new deposits are likely to be found in environmentally fragile areas where the risks and costs are far greater than in the older ones.
- 10. Orderly economic growth today requires broad policies and plans for land use, energy, and ecology that can be developed and administered by government only at the expense of some limitations on free enterprise, private ownership of land, and individual behavior.
- 11. Successes already achieved in environmental protection are threatened by reversal as economic interests organize to achieve "wise use" or "balanced use" or "multiple use" of land and resources, thereby obliterating wilderness altogether.
- 12. A growing population would require economic growth merely to maintain the present unsatisfactory levels of consumption of goods and services for the great majority of the people of the



Marine Sanctuaries of the United States.

world, so that cutbacks in production can only make a bad situation worse.

13. A growing population growing wealthier would also require more recreational facilities on land and offshore in areas not yet urbanized, thereby placing even greater pressure on our remaining rural and wilderness areas and in the most biologically productive area of the sea.

14. Establishment of marine parks, sanctuaries, and reserves to protect rare, scenic, or scientifically important portions of the sea can conflict with marine transportation and fisheries needed by a growing population.

15. Political democracy can best be achieved and maintained in a society that is reasonably prosperous and in which wealth is reasonably equitably distributed, but these conditions can only be developed over a period of time at some environmental cost.

In these 15 points alone, without even considering other summary points that could be made or our more elaborate discussion

that led up to them, we can see all the components suggested by Kasperson and Minghi: "political goals, agents of impress, processes and effects." But using these components in a linear fashion to analyze environment-politics relationships could quickly lead to an analytical dead end. They themselves are interrelated in complex ways. The agents of impress, for example, may select the political goals they wish to reach but find that they have a very limited range of processes from which to choose, while the effects of their choices are felt by people who played no role in the selection of goals, agents, or processes and may object to all of them.

The political geography of everyday life, as we have seen, affects every single individual on the planet, in multiple ways, everywhere one goes, awake or asleep. Students of the subject understand the factors we have discussed and others we have had to omit; they see the world through different eyes than other people, and that should enable them to make wiser decisions. They should be able to help make the world just a little bit better.

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