## Key Concepts and Summary

### 12.1 The Economics of Pollution

Economic production can cause environmental damage. This tradeoff arises for all countries, whether high-income or low-income, and whether their economies are market-oriented or command-oriented.

An externality occurs when an exchange between a buyer and seller has an impact on a third party who is not part of the exchange. An externality, which is sometimes also called a spillover, can have a negative or a positive impact on the third party. If those parties imposing a negative externality on others had to account for the broader social cost of their behavior, they would have an incentive to reduce the production of whatever is causing the negative externality. In the case of a positive externality, the third party obtains benefits from the exchange between a buyer and a seller, but they are not paying for these benefits. If this is the case, then markets would tend to under produce output because suppliers are not aware of the additional demand from others. If the parties generating benefits to others would somehow receive compensation for these external benefits, they would have an incentive to increase production of whatever is causing the positive externality.

### 12.2 Command-and-Control Regulation

Command-and-control regulation sets specific limits for pollution emissions and/or specific pollution-control technologies that firms must use. Although such regulations have helped to protect the environment, they have three shortcomings: they provide no incentive for going beyond the limits they set; they offer limited flexibility on where and how to reduce pollution; and they often have politically-motivated loopholes.

### 12.3 Market-Oriented Environmental Tools

Examples of market-oriented environmental policies, also called cap and trade programs, include pollution charges, marketable permits, and better-defined property rights. Market-oriented environmental policies include taxes, markets, and property rights so that those who impose negative externalities must face the social cost.

### 12.4 The Benefits and Costs of U.S. Environmental Laws

We can make a strong case, taken as a whole, that the benefits of U.S. environmental regulation have outweighed the costs. As the extent of environment regulation increases, additional expenditures on environmental protection will probably have increasing marginal costs and decreasing marginal benefits. This pattern suggests that the flexibility and cost savings of market-oriented environmental policies will become more important.

### 12.5 International Environmental Issues

Certain global environmental issues, such as global warming and biodiversity, spill over national borders and require addressing with some form of international agreement.

### 12.6 The Tradeoff between Economic Output and Environmental Protection

Depending on their different income levels and political preferences, countries are likely to make different choices about allocative efficiency—that is, the choice between economic output and environmental protection along the production possibility frontier. However, all countries should prefer to make a choice that shows productive efficiency—that is, the choice is somewhere on the production possibility frontier rather than inside it. Revisit [Choice in a World of Scarcity](http://openstax.org/books/principles-microeconomics-3e/pages/2-introduction-to-choice-in-a-world-of-scarcity) for more on these terms.