Unnumbered 20 p549
Environmental Science

Chapter 20
Sustainability, Economics, and Equity P. 549 ESBK
AXES Paragraph p. 38 NB

1/7 Agenda

- "Wanted" Poster Presentation
- CH 20 Warm up, pg. 80
- Current Events:
  - Monica, Bryan, Rachana
- Taboo Review
- HW:
  - Study for quiz
  - Notebook check p. 76-81, 83, 85, 87 (no p. 82, 84, 86)

Wanted Poster Rubric

- 15 points: Analysis questions
- 8 points: Front poster questions
- 2 points: Presentation
- 2 points Extra credit: creativity

1/7 Sustainability is the Ultimate Goal CH 20

Obj. TSW explain what it means to be sustainable in a variety of environmental contexts including human well-being. P. 80NB

Chapter 20 Opener
Environmental Science

1. What is Sustainability?
2. Draw the two Sustainable Economic Systems, How is one better than the other?
3. What is the triple bottom line and how is it achievable?

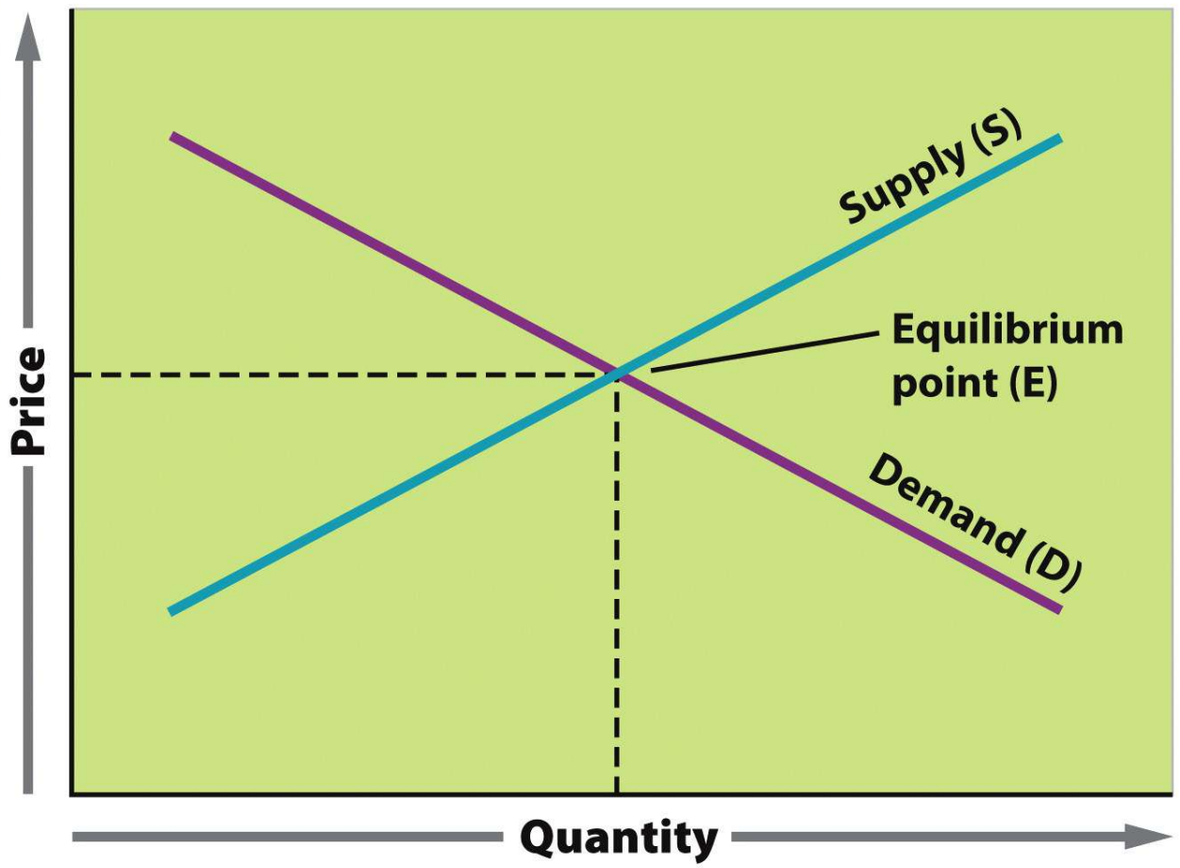

Figure 20.1
Environmental Science

Sustainability

- Something is sustainable when it meets the needs of the present generation without compromising the ability of future generations to meet their own needs
- Sustainability will not be achieved if certain groups are exposed to a disproportionate share of dirty jobs or waste materials in the home or workplace
- **Sustainable environmental systems-** Must allow for maintaining clean air, water, land, and biosphere systems; Must maintain human well being, the status of being healthy, happy, and prosperous

Current Economy

Relies heavily on resource extraction, and energy, little on ecosystem resources, & produces large amounts of waste.

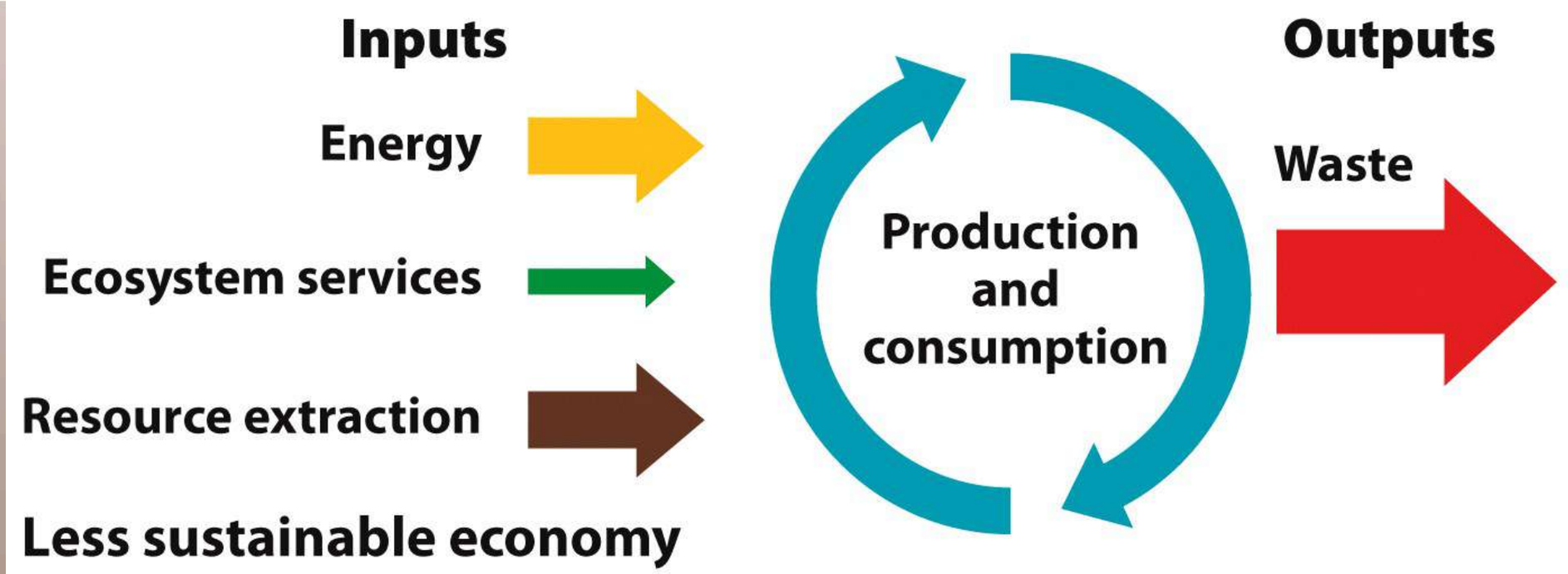

Figure 20.7a
Environmental Science

Ecosystem services are the processes by which life-supporting resources such as clean water, timber, fisheries, & agricultural crops are produced. P. 77 – 80 ESBK

Future?

Greater use of Ecosystem services, with recycling , less energy input, and less resource extraction, with less waste produced.

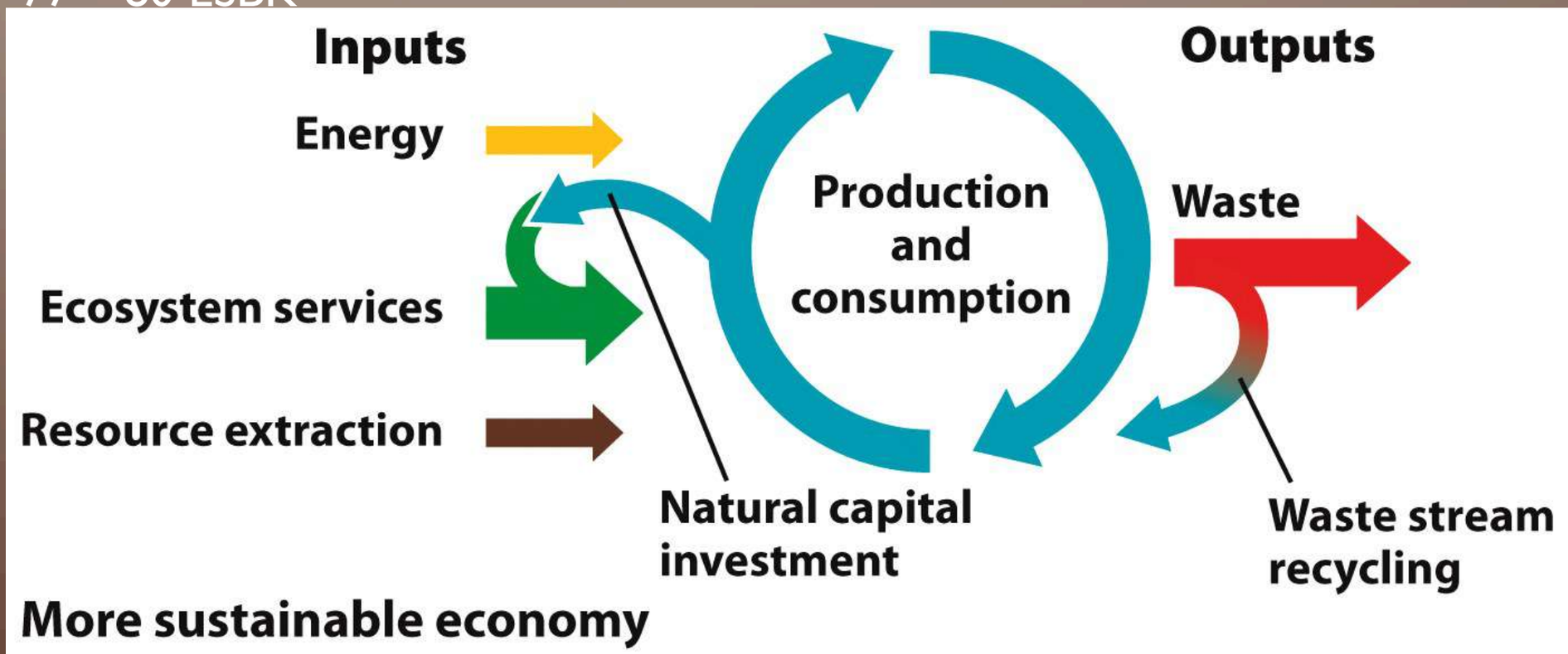

Figure 20.7b
Environmental Science

The Triple Bottom Line – sustainability is believed to be attained through the intersection of the three circles.

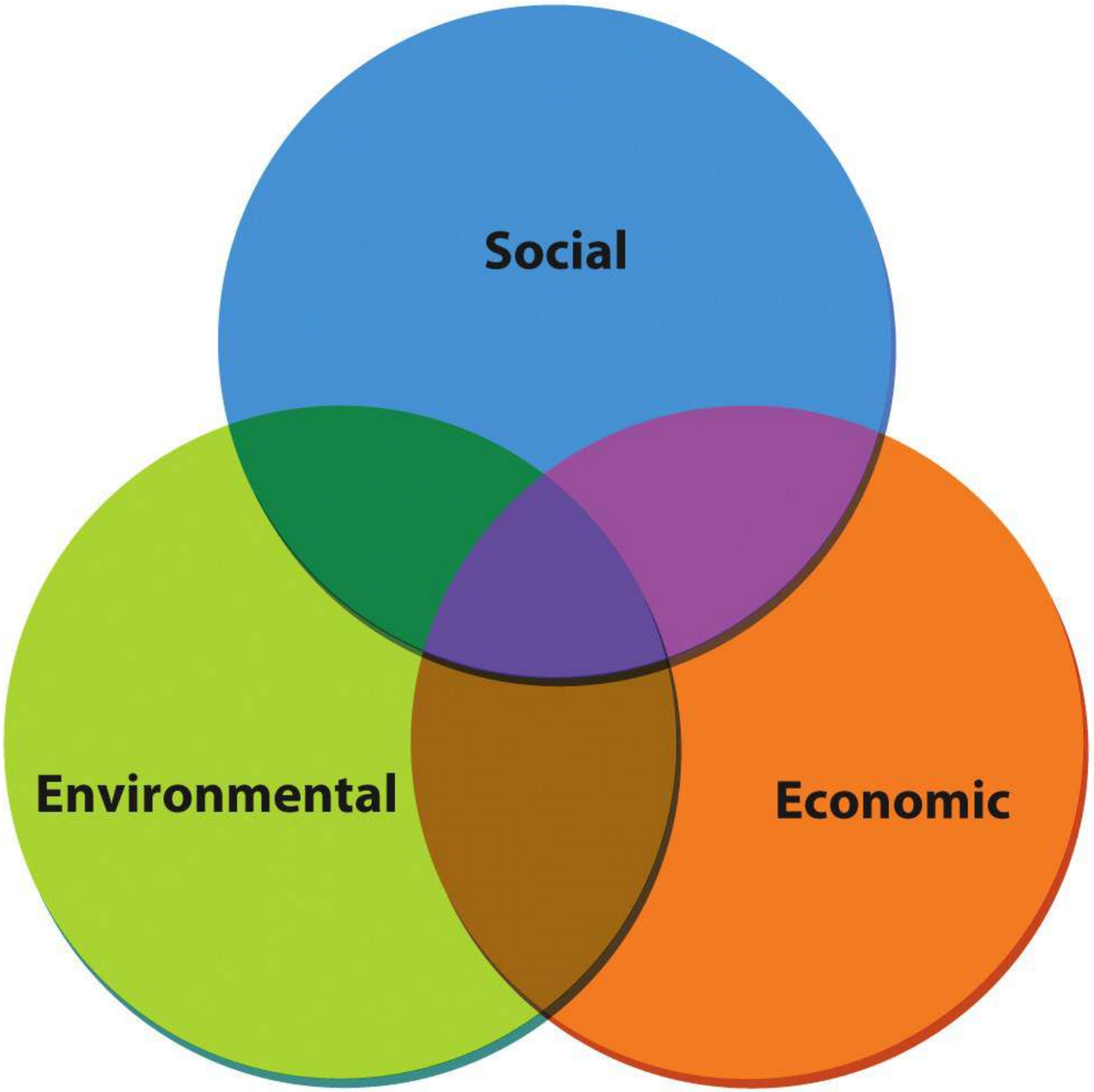

Figure 20.13
Environmental Science

- Need to take in to account <u>three factors</u> when making decisions about business, economy, and development
- True success when there is adequate treatment of BOTH humans and environment

Taboo Review

- SustainabilityEndangered
- Sustainable Economic Systems**Invasive species**
- Triple Bottom Line
- **Greenhouse Effect**
- Anthropogenic vs. natural sources
- Global change
- Climate change
- Infrared radiation
- **Greenhouse gases**
- **Florida Panther**
- Threatened

4/29 Economics & Supply & Demand CH20

Obj. TSW learn the laws of supply and demand, GPI, Kuznets Curve and how they can be a measurement of a countries well – being. P. 40 NB

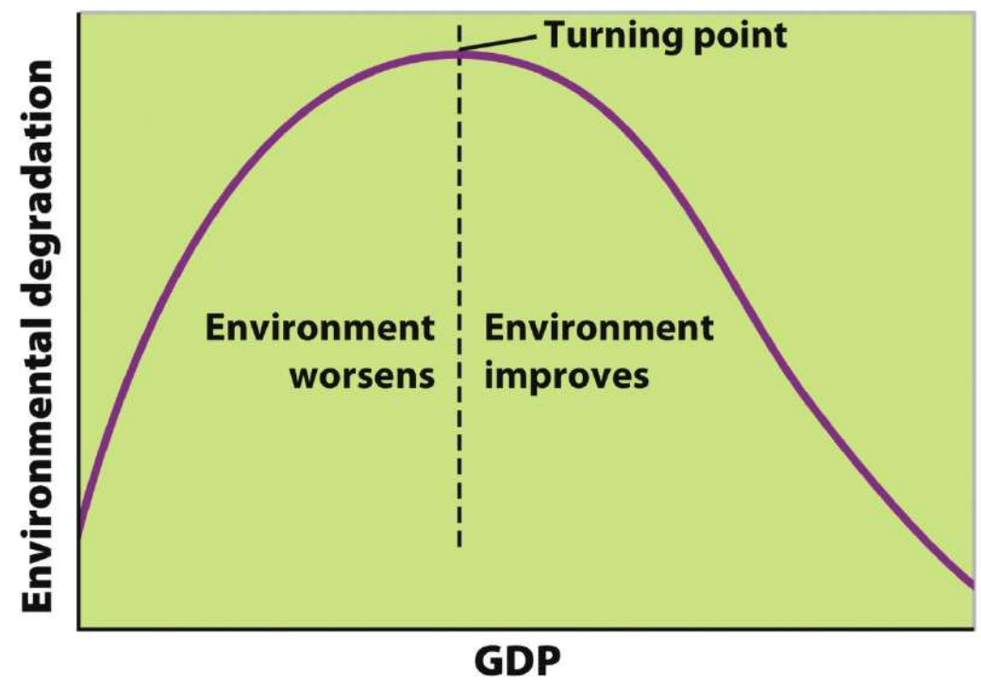

Figure 20.4
Environmental Science
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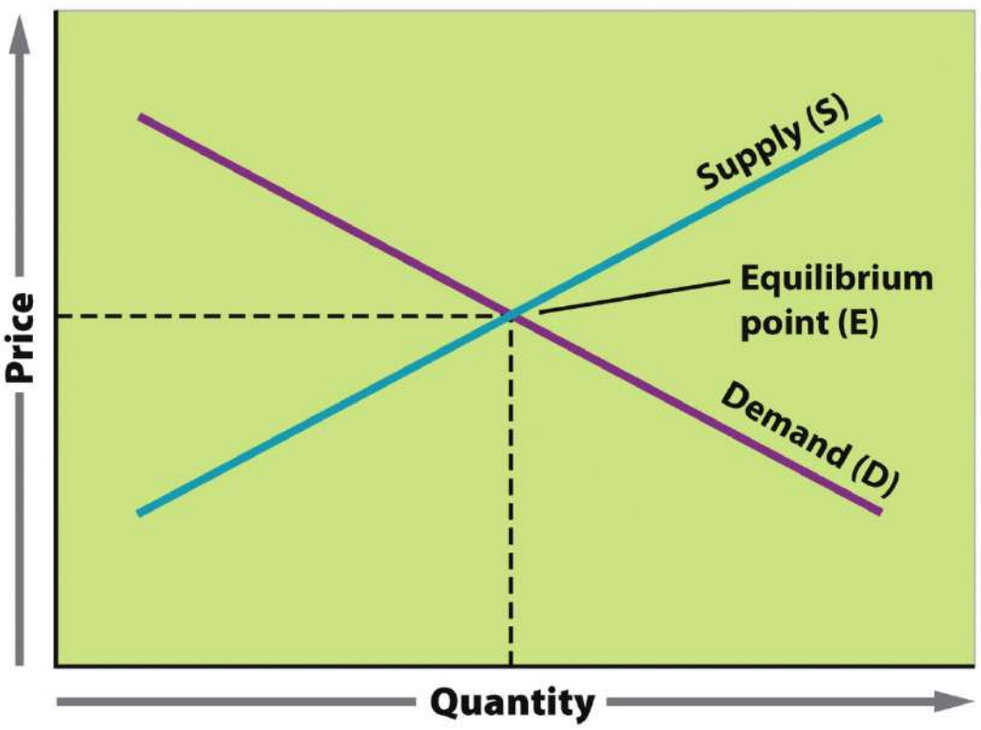

Figure 20.1
Environmental Science
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1. Draw the Supply and demand curve, If there is an increased demand for oil, what happens to the price?
2. What is the relationship between the GPI and the GDP with respect to human well being.
3. Explain the Kuznets curve.

Kuznet's Curve

As GDP increases, population growth slows. This in turn should lead to a decrease in anthropogenic environmental degradation. Wealthier, developed countries a can purchase goods & services that lead to environmental improvements. Pollution Control devices such cars with catalytic converters.

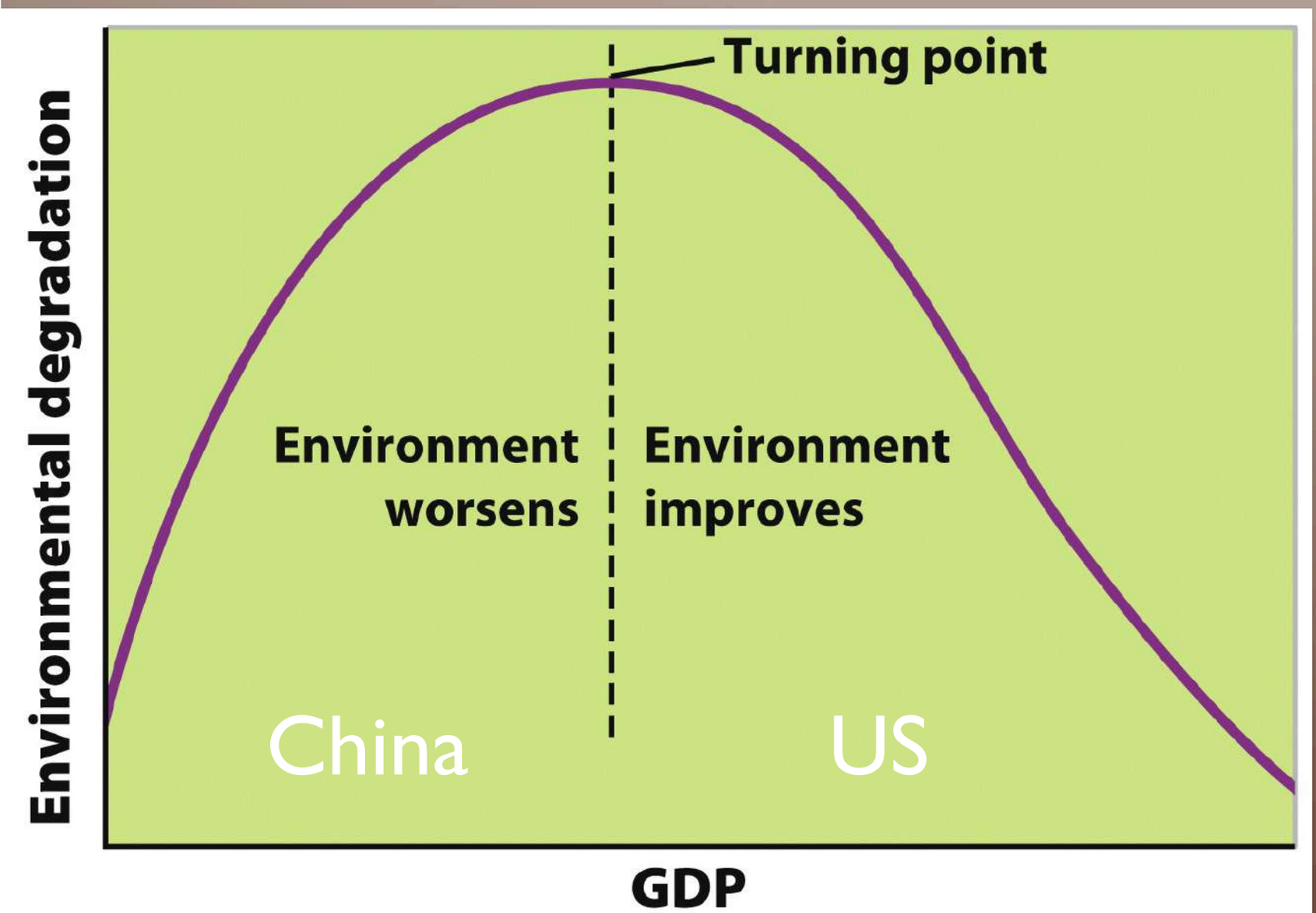


Figure 20.4
Environmental Science

However, some developed countries may use more resources that lead to environmental degradation.

Agenda 11/6

- Warm up
- Collect Lab write up on ground water filters
- Environmental current events
- Discuss mining activity
- Ecocolumn Data
- Study/ review for topic IV Test tomorrow
- Pass out WS - abstract on sustainability & on APES FRQ analysis

4/30 Economic Health CH 20

Obj. TSW learn how micro lending can improve well being and how to have a sustainable economic system. P. 42 NB

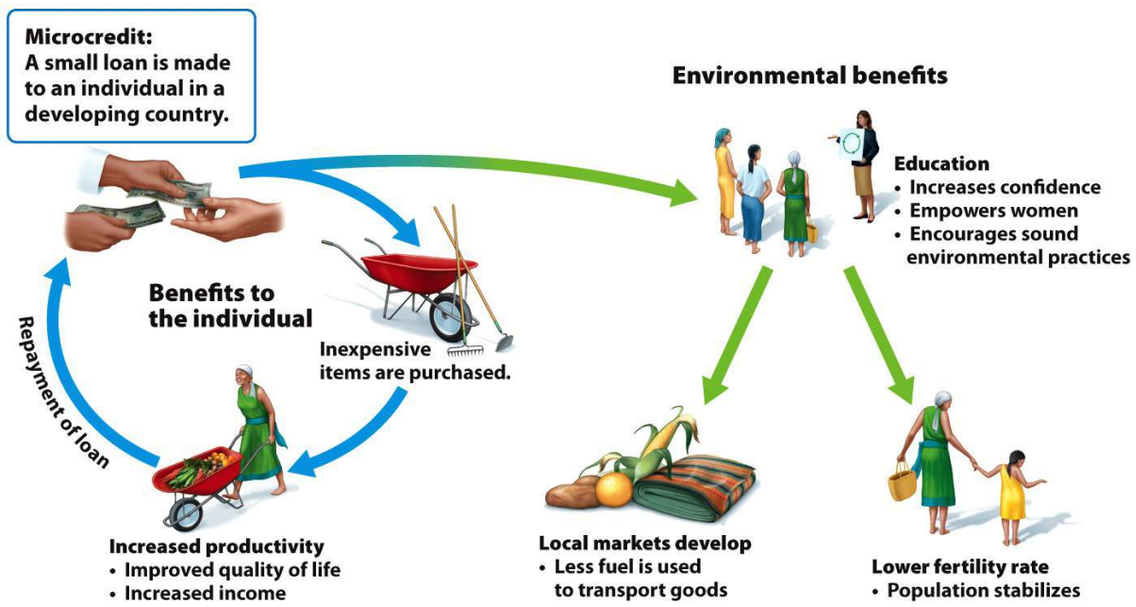


Figure 20.6
Environmental Science

1. What is micro lending and how is it helpful?
2. ID & describe the three types of Capital.
3. Draw the two Sustainable Economic Systems, How is one better than the other?

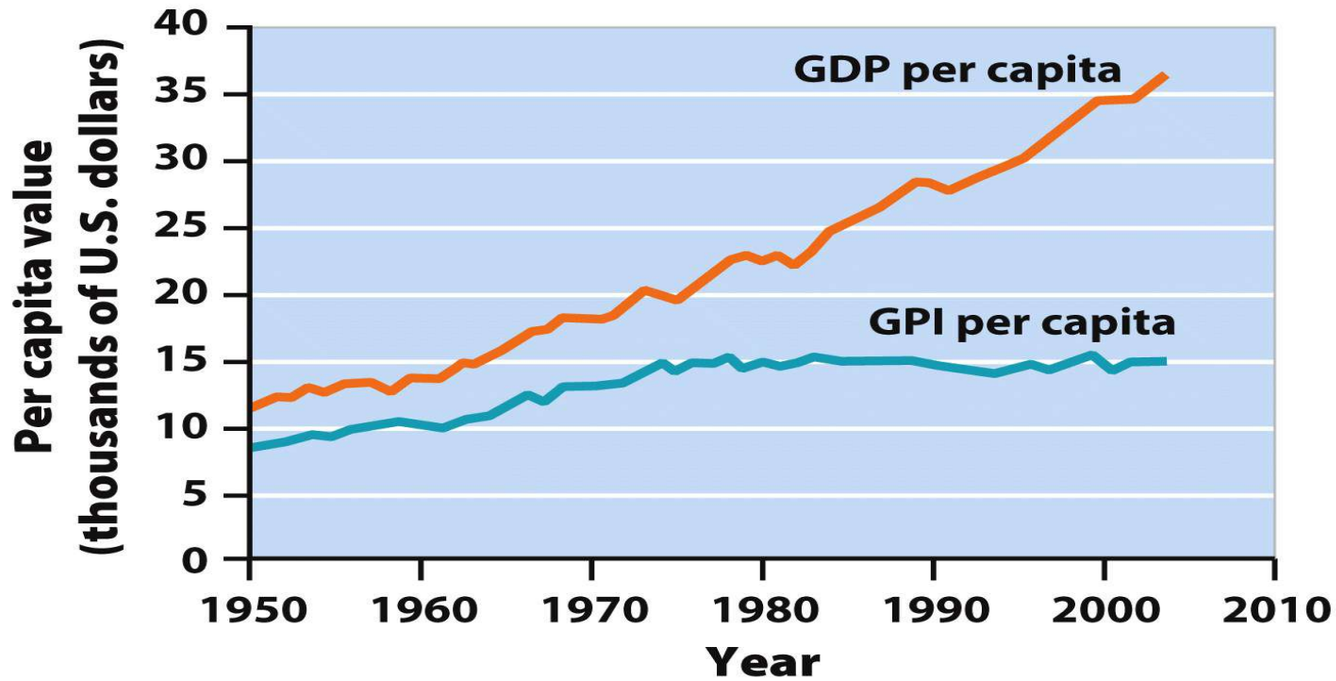


Figure 20.3
Environmental Science

11/7 Agencies, Laws & Regulations CH 20

Obj. TSW learn how products can be reused after their initial purpose, how the three environmental world views are important. P. 34NB

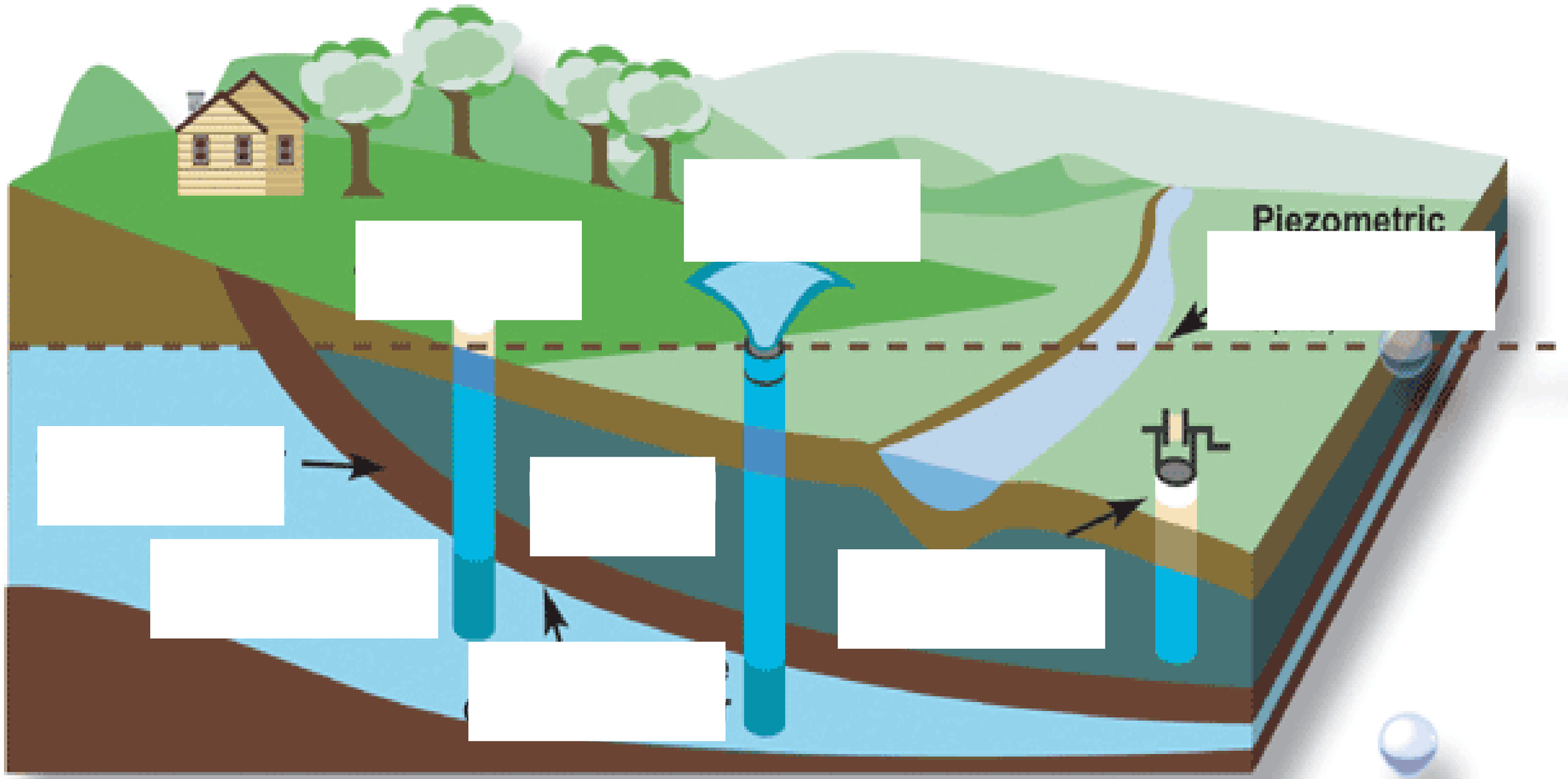
1. List & describe the three types of environmental world views?

2. Describe the Cradle to cradle system.

3. How is the triple bottom line achievable?

Aquifers and wells

Where is the impervious layer?



Source: Environment Canada

Scarcity

A market occurs whenever people engage in trade.
In a market economy, the cost of a good is determined by supply and demand. The intersection of the supply and demand curve determines the market equilibrium point for that item.

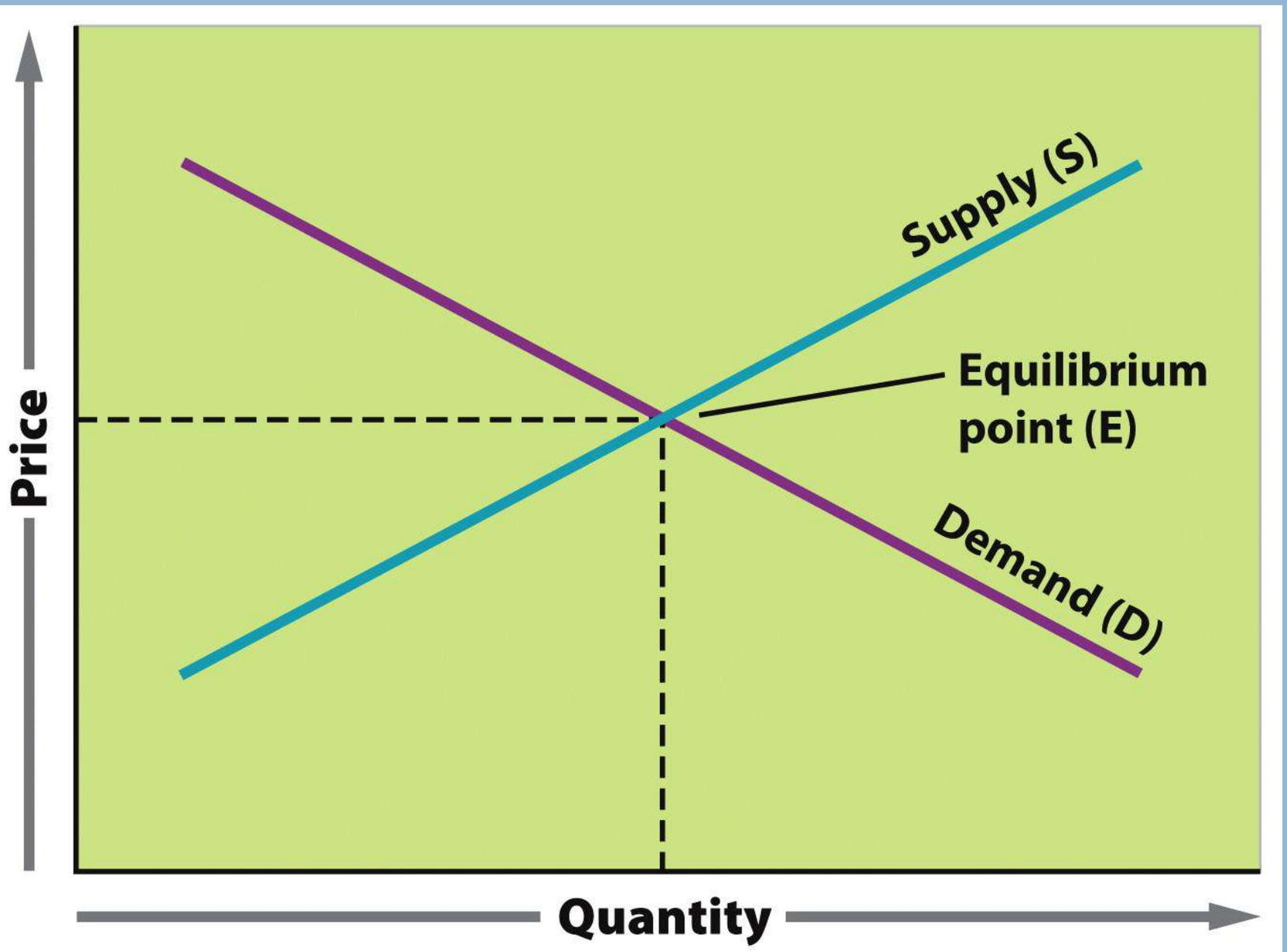


Figure 20.1
Environmental Science

Supply

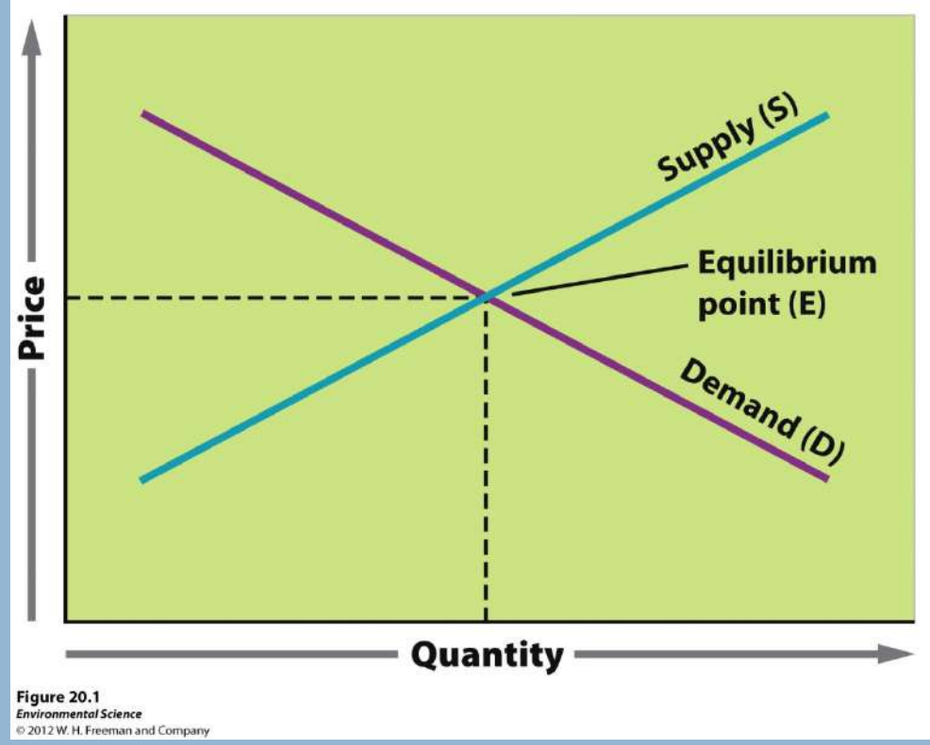


Figure 20.1
Environmental Science

- The supply curve (s) shows how many units that suppliers of a given product or service are willing to supply.
- If you are the only supplier of this product, and many people want it, you are likely to be willing to produce many of the product.
- However, if there is competition for your product, you may be concerned how many you can sell and will produce less now that you share the market with other suppliers.
- Slopes upwards

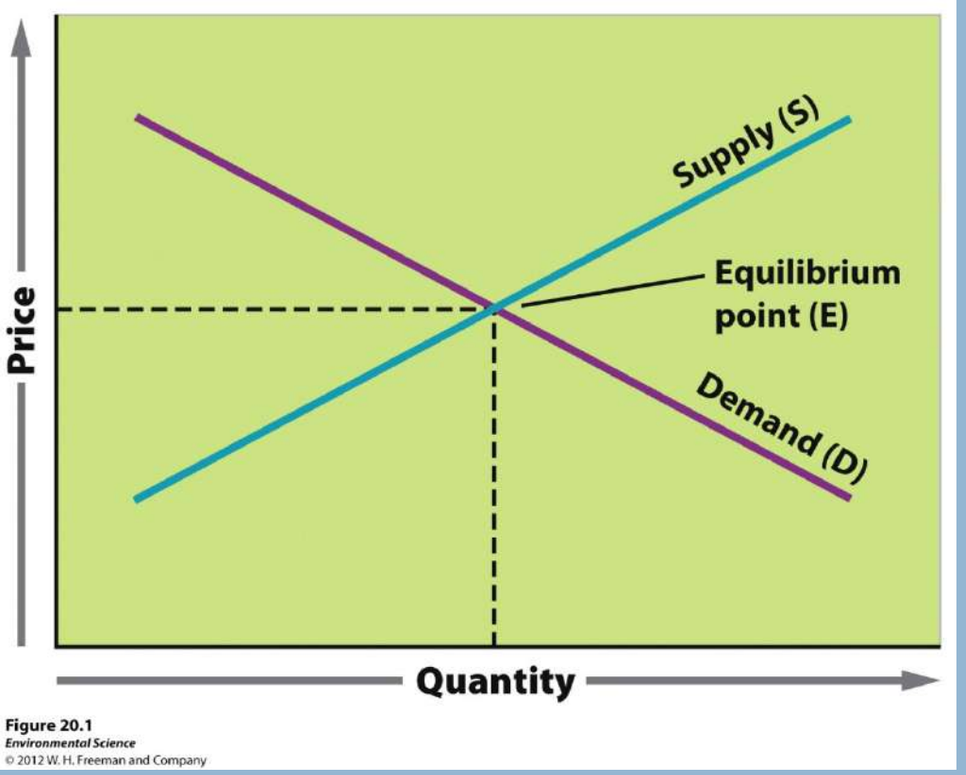


Figure 20.1
Environmental Science

Demand

- The demand curve (D) shows how much of a good consumers want to buy.
- Factors that determine demand include income, price of the good, tastes, expectations, and the number of people who want the good.
- The **demand** curve slopes **downwards** because as the price of the good rises, the demand declines.

The Law of Demand

- When the price of a good rises, the quantity demanded falls and when the price falls, demand rises.

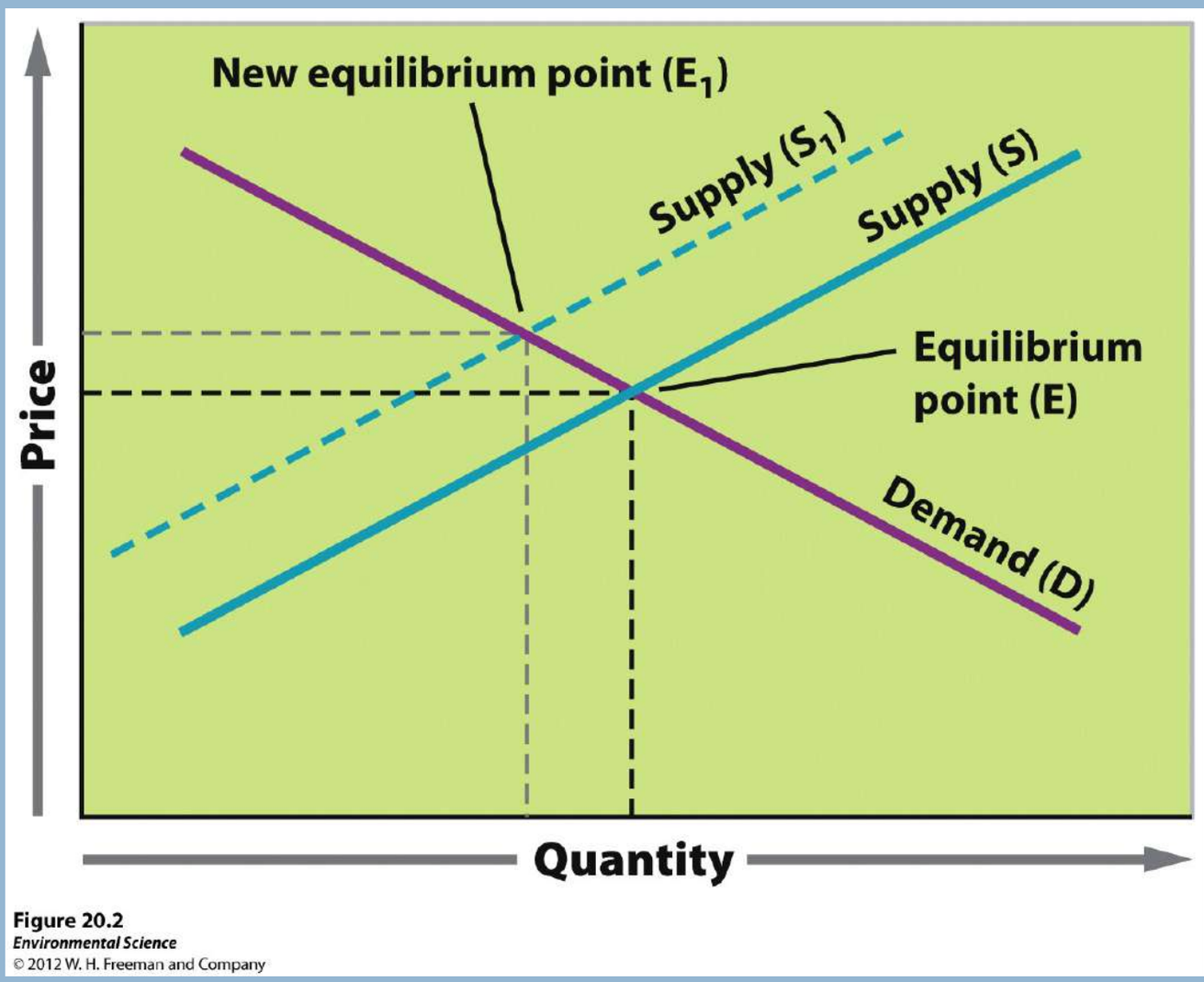
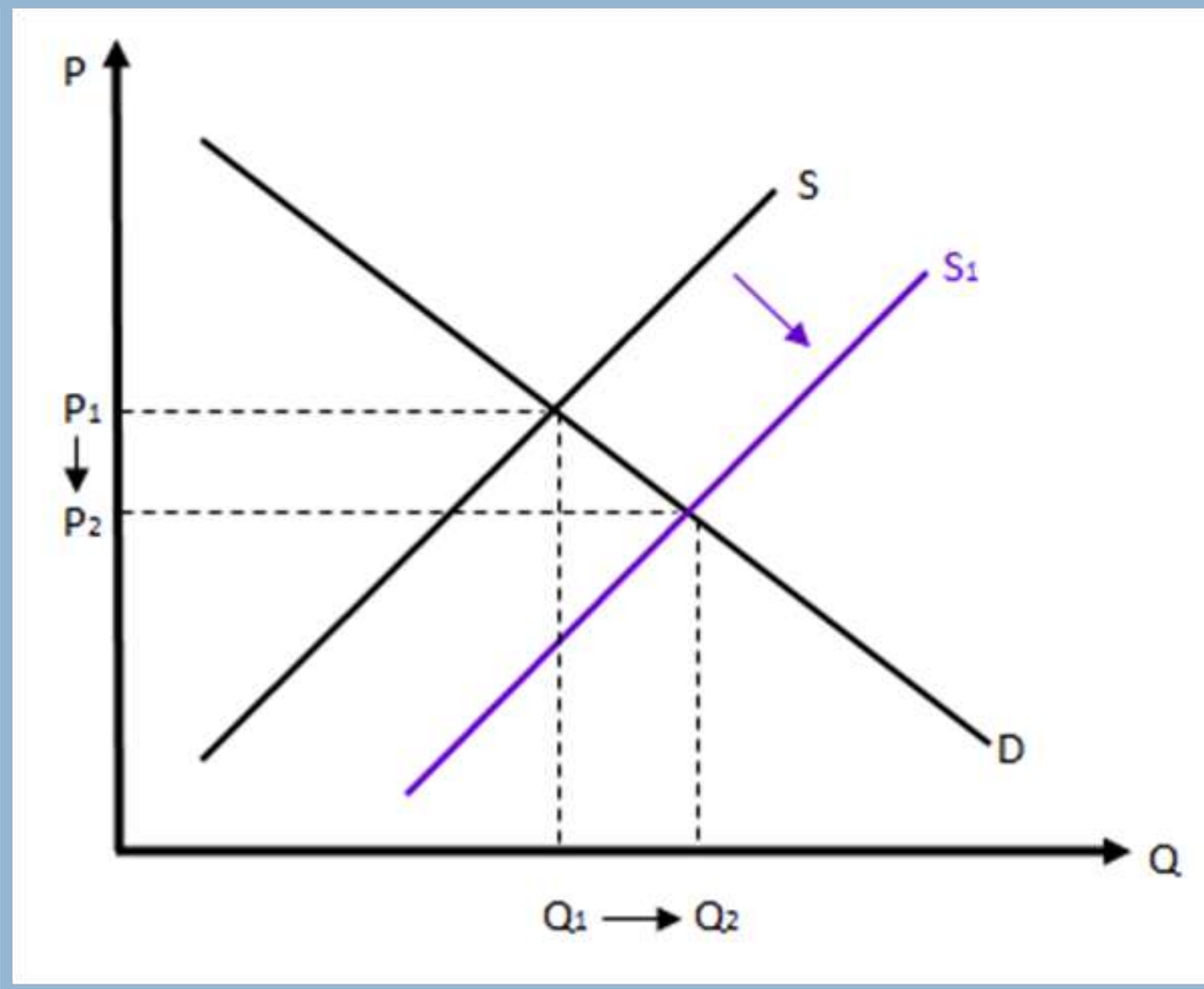
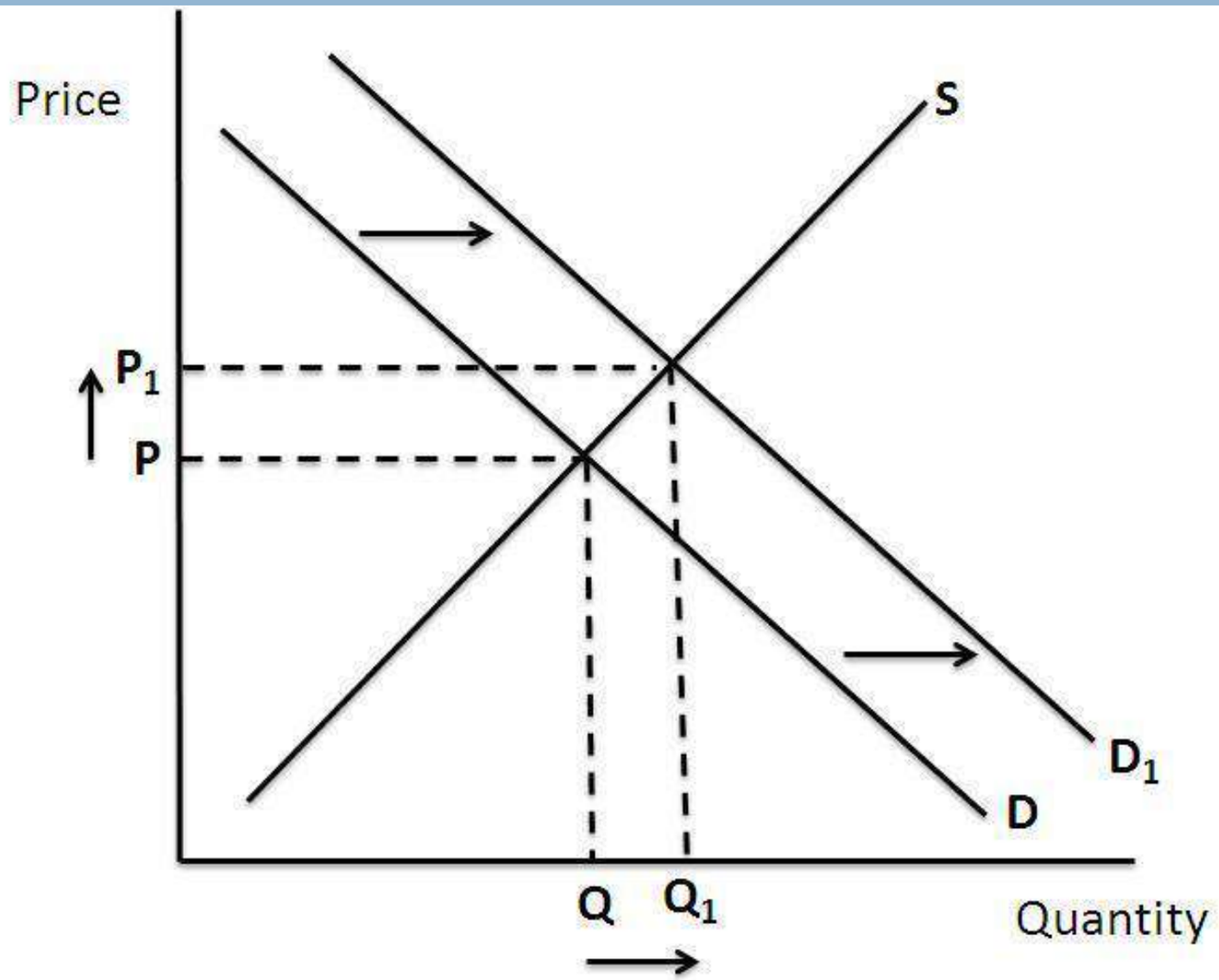


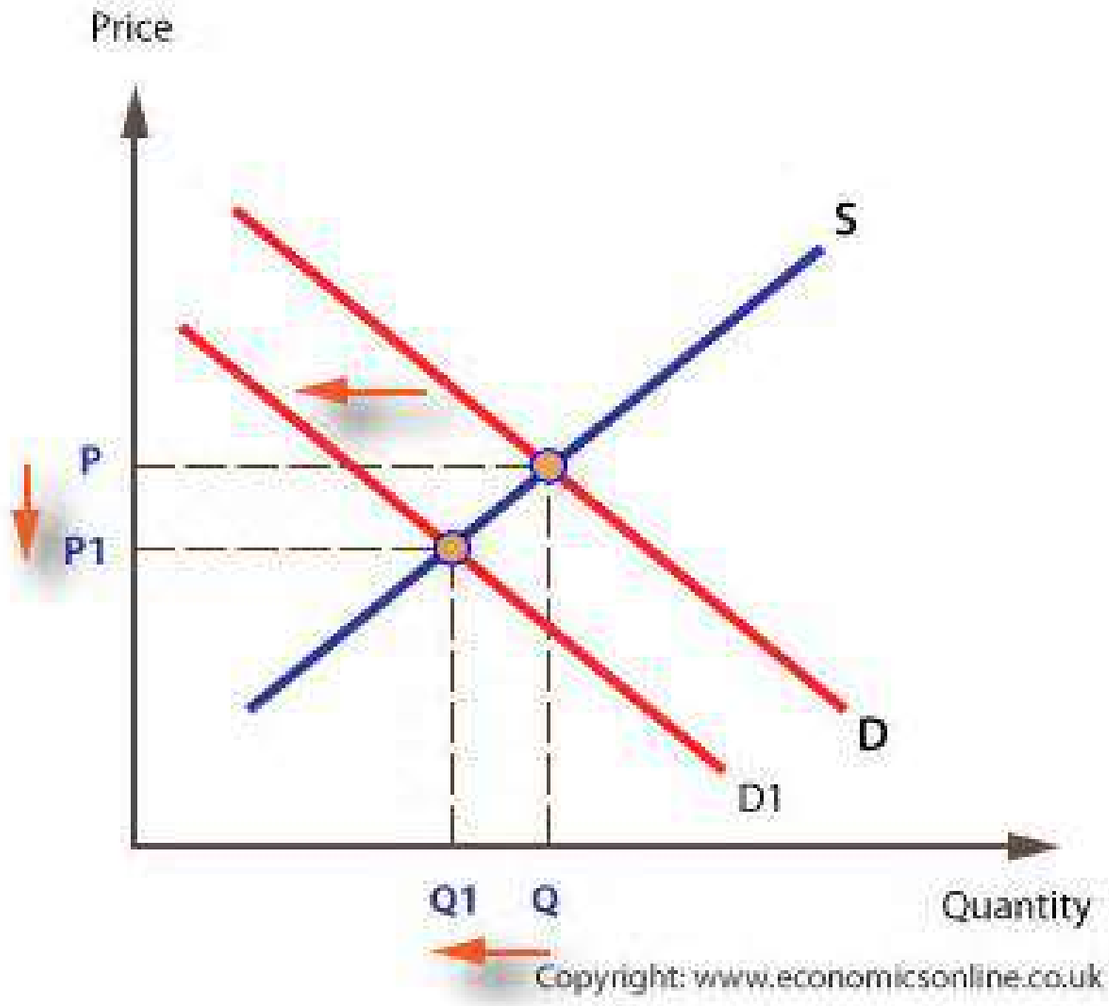
Figure 20.2
Environmental Science



The Law of Supply

- When the price of a good rises, the quantity supplied of that good will rise and when the price of a good falls, the quantity of the good supplied will also fall.





Equilibrium

- When the price of a good comes to an equilibrium point and the two curves (S and D) intersect on the graph.
- At this price, suppliers find it worthwhile to supply exactly as many of the product as consumers are willing to buy.

Externalities

- The costs or impact of a good or service on people and the environment not included in the economic price of that good or service.
- Ex. costs of using common resources such as water, air, land, or the oceans and the costs of air and water pollution or solid waste products.

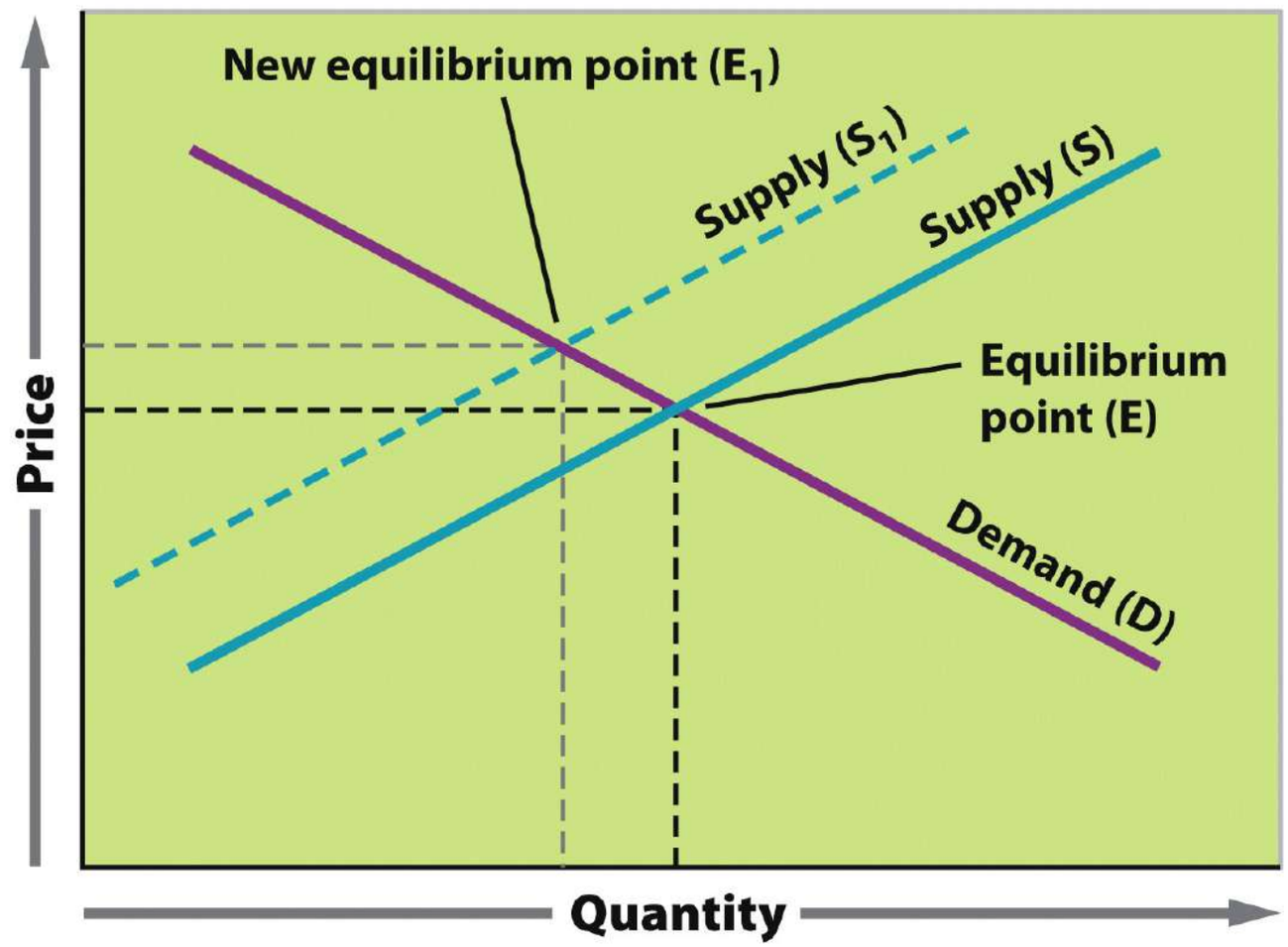


Figure 20.2
Environmental Science

When the cost of emitting pollutants is included in the price of a good, the price increases. This causes the supply curve to shift to the left. The Law of Demand states that when the price of a good goes up, demand falls, a new equilibrium is reached.

Wealth and Productivity

- **GDP (gross domestic product)-** the value of all products and services produced in a year in a given country. GDP does not reflect externalities such as pollution & land degradation.

- **GPI (genuine progress indicator)-** attempts to address this shortcoming by including measures of personal consumption, income distribution, levels of higher education, resource depletion, pollution, and the health of the population.

Genuine progress indicator versus gross domestic product, per capita.

Gross Domestic Product measures the value of all products & services a country produces.

Genuine Progress Indicator attempts to include the level of education, personal consumption, income distribution, resource depletion, pollution, and the health of the population.

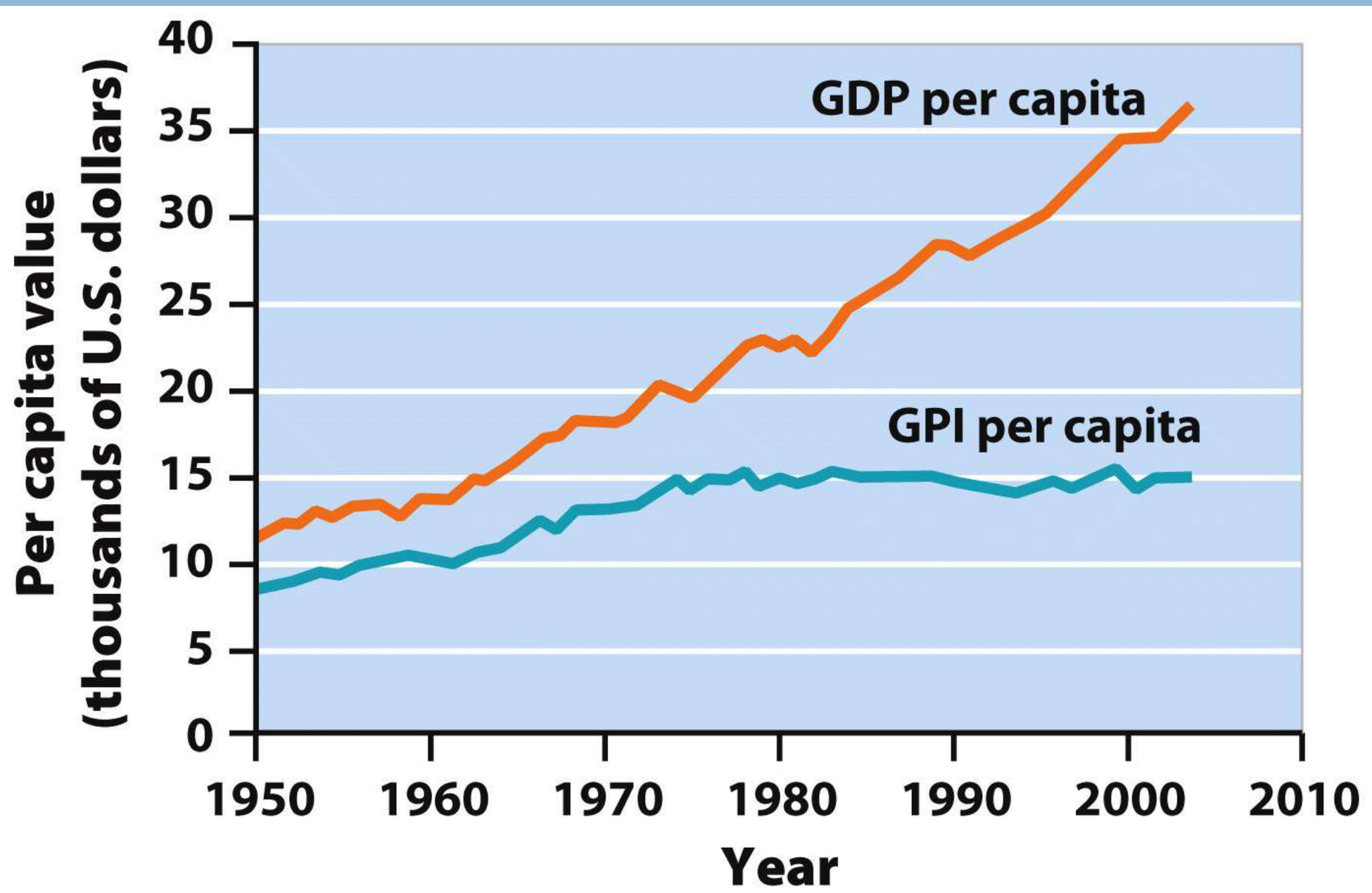


Figure 20.3
Environmental Science

Kuznet's Curve

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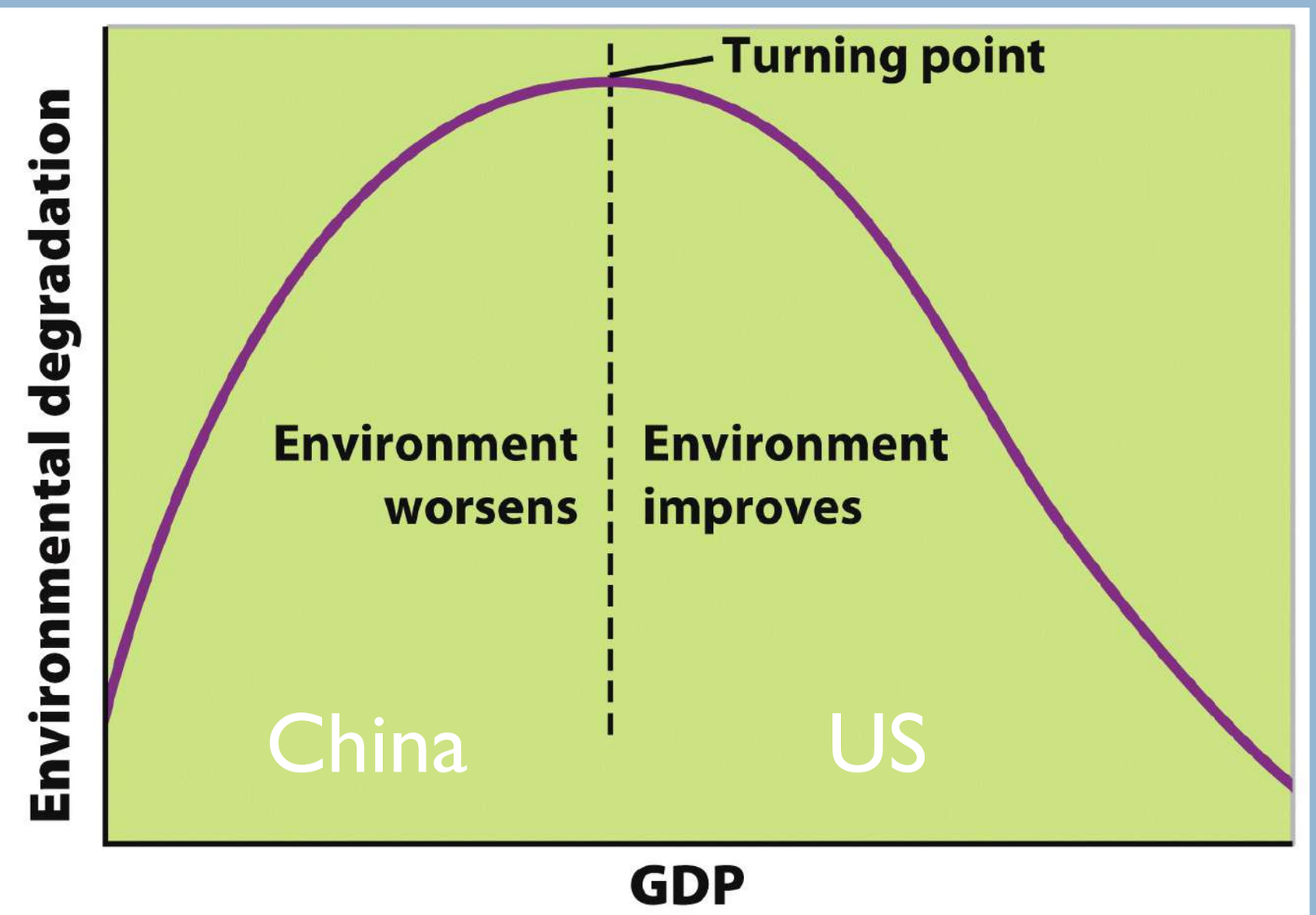

Figure 20.4
Environmental Science

However, some developed countries may use more resources that lead to environmental degradation.

Solar Panels in Africa

Photovoltaic solar cells are less expensive & more environmentally friendly than a traditional electrical infrastructure.

Figure 20.5
Environmental Science

Microlending

- The practice of loaning small amounts of money to people who intend to start a small business in less developed countries.
- Individuals may feel **suppressed** by government laws. When they offer hope or help they do not feel as suppressed.

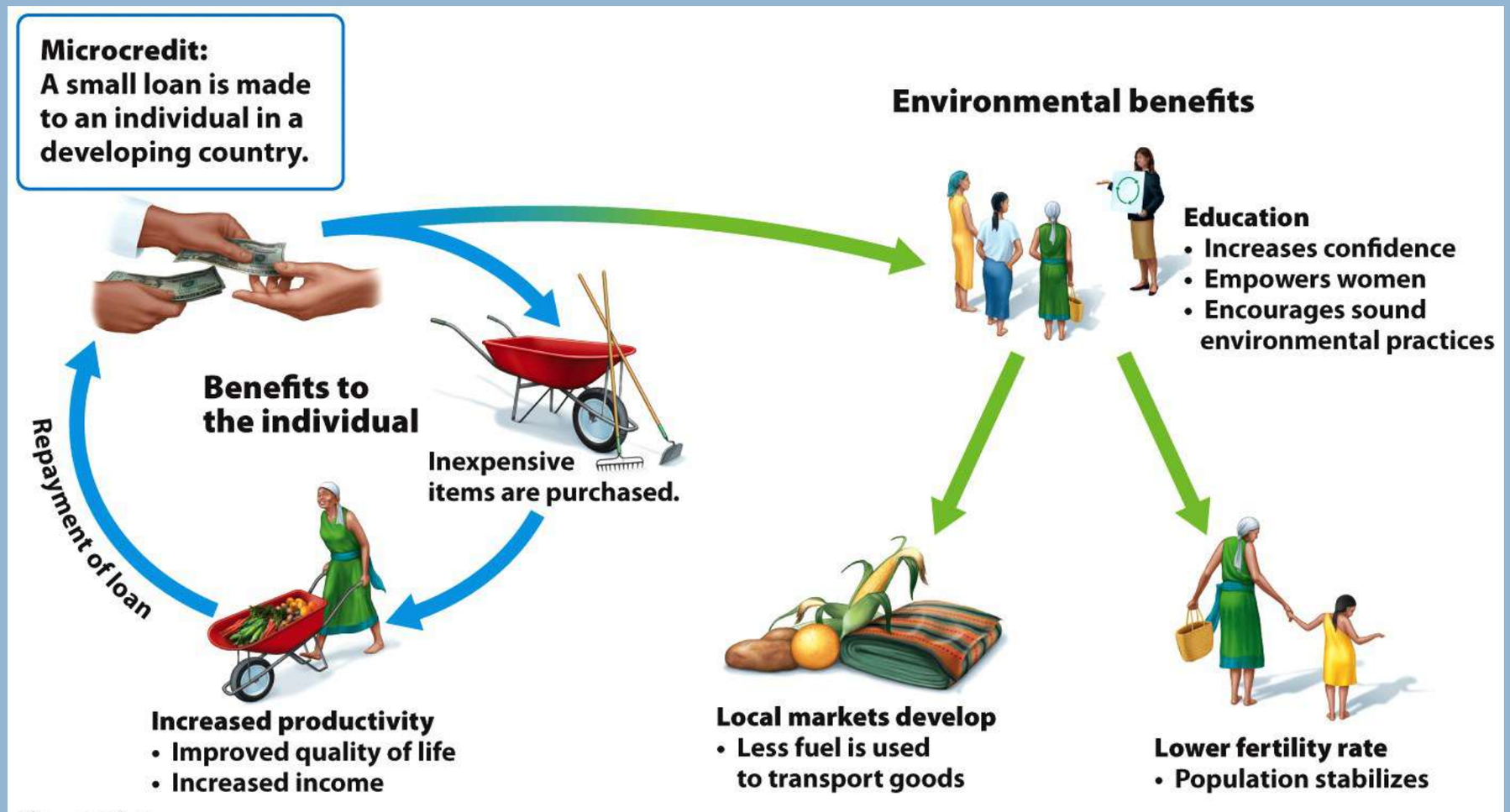

Figure 20.6
Environmental Science

Current Economy

Relies heavily on resource extraction, and energy, little on ecosystem resources, & produces large amounts of waste.

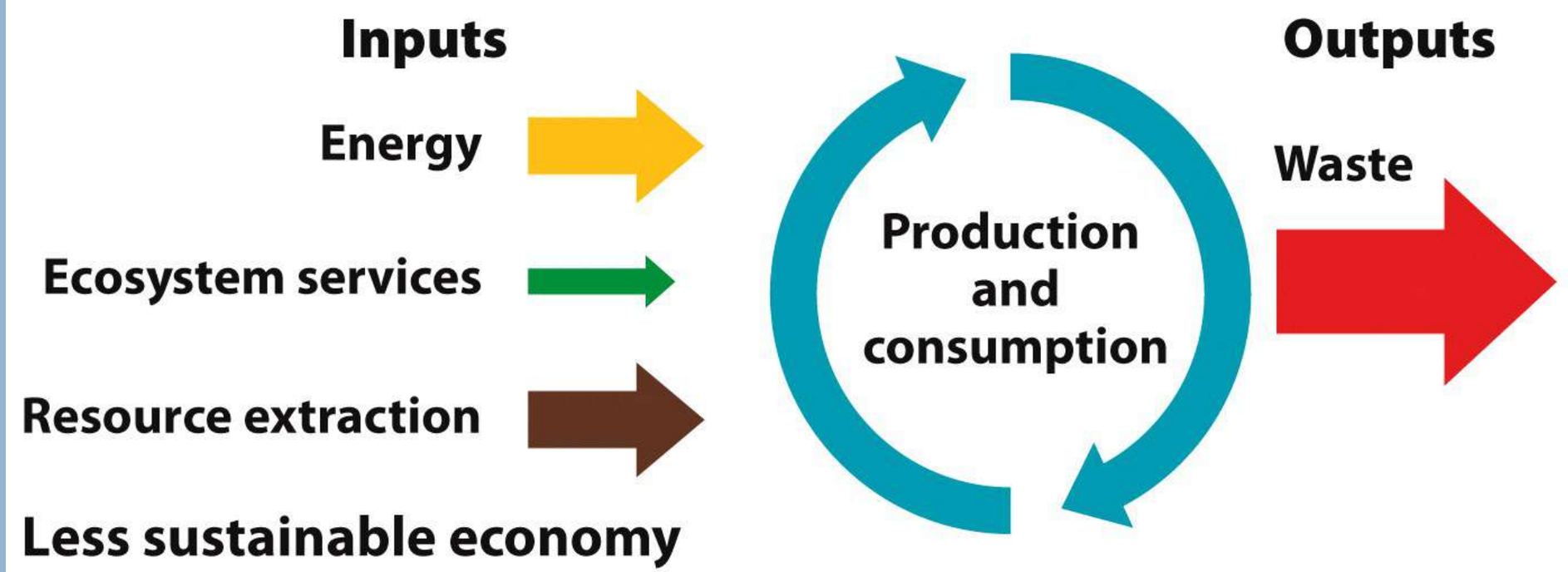

Figure 20.7a
Environmental Science

Ecosystem services are the processes by which life-supporting resources such as clean water, timber, fisheries, & agricultural crops are produced. P. 77 – 80 ESBK

Future?

Greater use of Ecosystem services, with recycling , less energy input, and less resource extraction, with less waste produced.

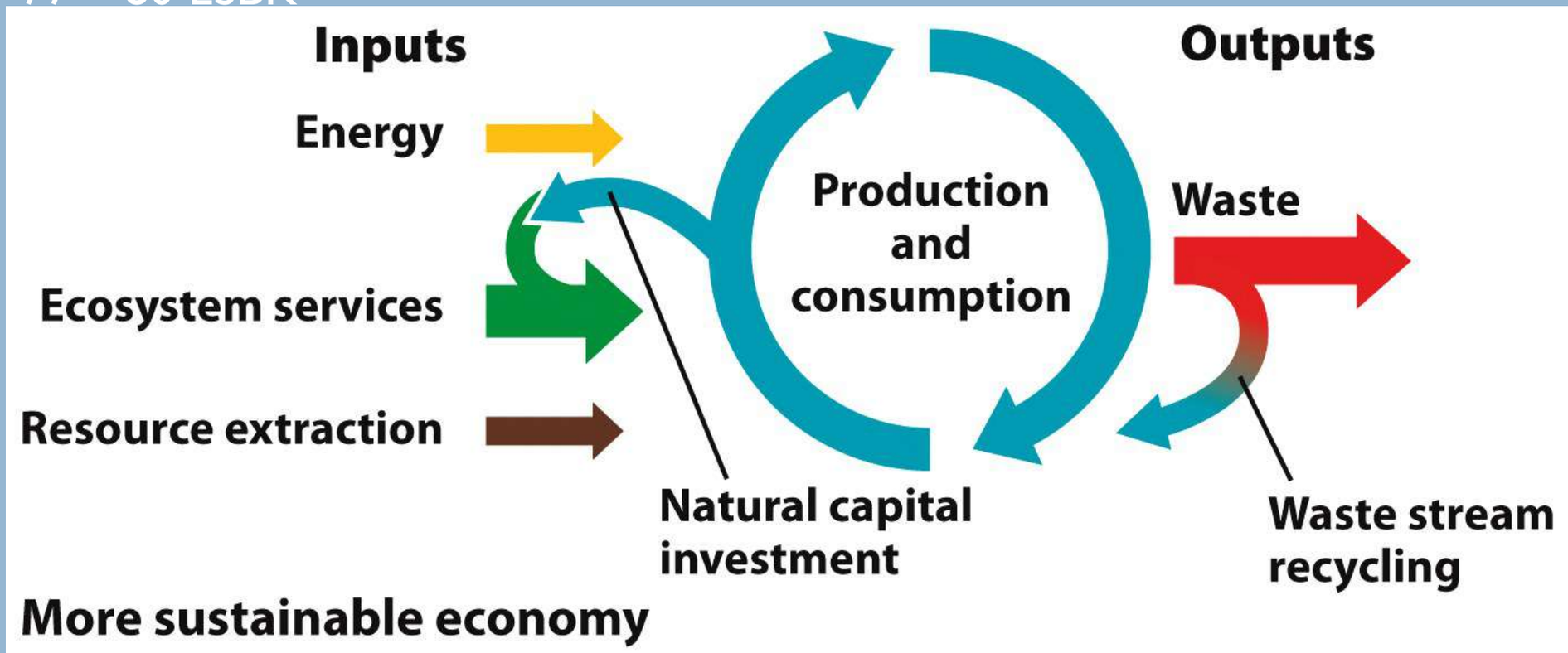

Figure 20.7b
Environmental Science

Cradle to Cradle System for Material use and Waste Recycling

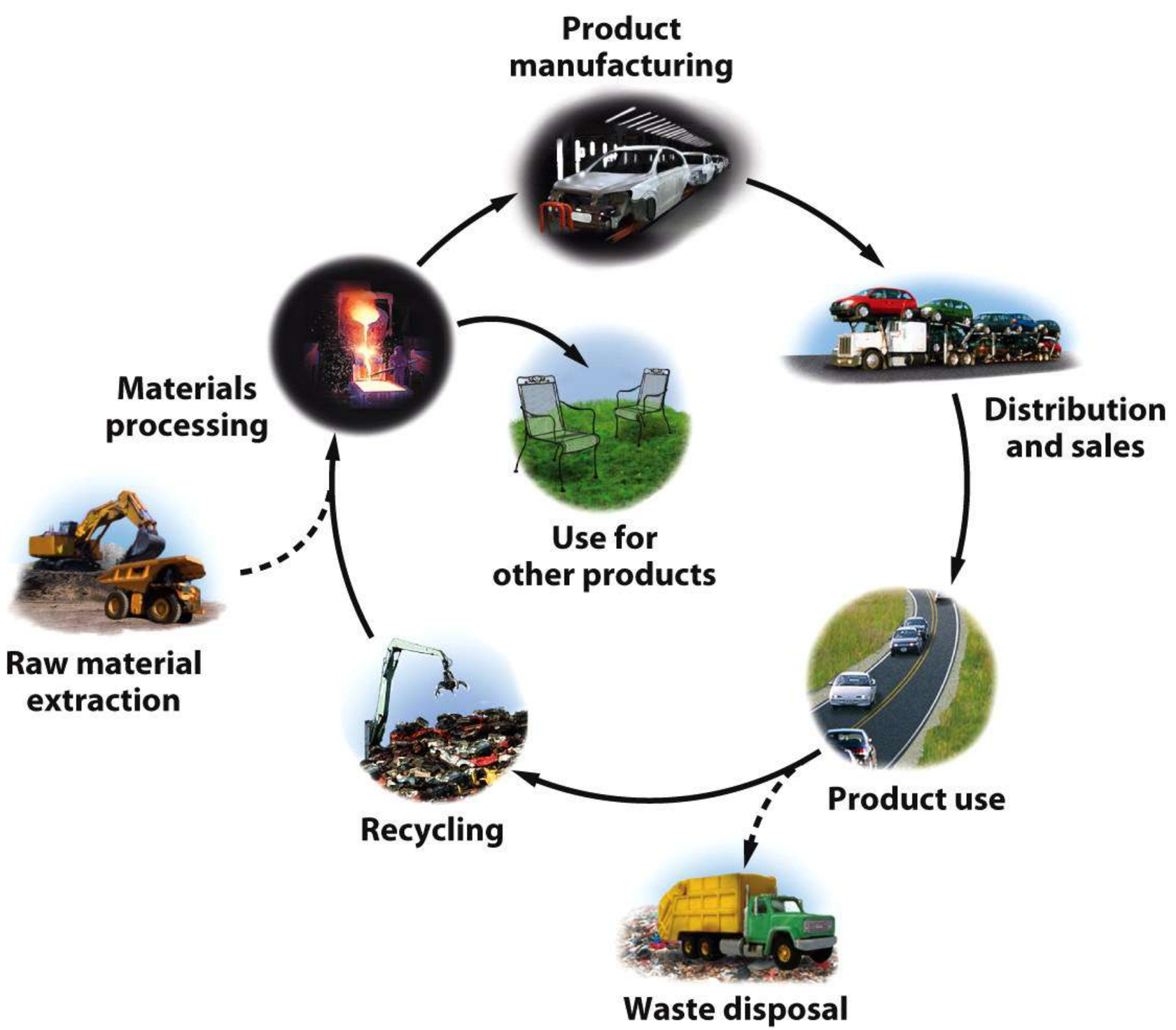

Figure 20.8
Environmental Science

Cradle to Grave System

If the responsibility is put on the consumer to recycle, there is not incentive for the manufacturer to make it easy to reuse or recycle an object. Not Sustainable.

Cradle to Cradle System

Goal is to produce a good that at the end of its useful life it can easily be reused to make a new product. More sustainable.

Environmental Worldviews

- **Anthropocentric**- human-centered, considers that human beings have intrinsic value and nature should provide for our needs.
- **Biocentric**- life-centered, says humans are just one of many species on Earth, all of which have equal value.
- **Ecocentric**- Earth-centered, places equal value on all living organisms and the ecosystems in which they live, and it demands that we consider nature free of any associations with our own existence.

World Agencies


Figure 20.9
Environmental Science
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Figure 20.10
Environmental Science
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- **United Nations (UN) –**1945 after WWII, An institution dedicated to promoting dialogue among countries with the goal of maintaining world peace.
- **United Nations Environment Program (UNEP) –** 1972 Gathers environmental information, conducts research, assesses environmental problems.
- **The World Bank- 1944** Washington DC, provides technical and financial assistance to developing countries to decrease poverty & promote growth.
- **The World Health Organization (WHO**) created in 1945. A group within the UN responsible for combating the spread of infectious diseases.
- **The United Nations Development Program (UNDP) –** New York City, 1965, advocate change that will help people obtain a better life through development.

United States Agencies

- The Environmental Protection Agency (EPA) –Washington DC, oversees all governmental efforts related to the environmental including science research assessment & education.
- The Occupational Safety and Health Administration (OSHA) – 1970, main federal agency responsible for the enforcement of health and safety regulations. It's mission is to prevent injuries, illnesses and deaths in the workplace.
- The Department of Energy (DOE) – 1977 – Advance the energy and economic security of the US. Includes scientific discovery, innovation, and environmental responsibility.

Make Flash Cards & Study!

TABLE 20.1 Major U.S. legislation for promoting sustainability

Act	Abbreviation	Year enacted	Purpose	Prime example of a success
National Environmental Policy Act	NEPA	1970	Enhance environment; monitor with a tool: the Environmental Impact Assessment	Protection of coral formation and sea turtles has occurred.
Occupational Safety and Health Act	OSHA	1970	Prevent occupational injuries, illness, death from work-related exposure to physical and chemical harm	Worker training and knowledge of toxins has increased.
Endangered Species Act	ESA	1973	Protect animal and plant species from extinction	Bald eagle, peregrine falcon, and gray wolf populations have recovered.
Clean Air Act	CAA	1970	Promote clean air	Sulfur dioxide reductions from cap-and-trade have occurred.
Clean Water Act	CWA	1972	Promote clean water	Swimmable and fishable rivers across the United States have increased.
Resource Conservation and Recovery Act	RCRA	1976	Govern tracking and disposal of solid and hazardous waste	Numerous brownfields and contaminated lands have been cleaned up.
Comprehensive Environmental Response, Compensation, and Liability Act	CERCLA, also called Superfund	1980	Force and/or implement the cleanup of hazardous waste sites	Dozens of Superfund sites have have been cleaned up around the United States.

Table 20.1
Environmental Science

Governmental Organizations

- WHO- World Health Organization
- WRI- World Resources Institute
- DOE- Department of Energy
- EPA- Environmental Protection Agency
- OSHA – Occupational Safety and Health Administration

Human Development Index

Higher values indicate greater development.

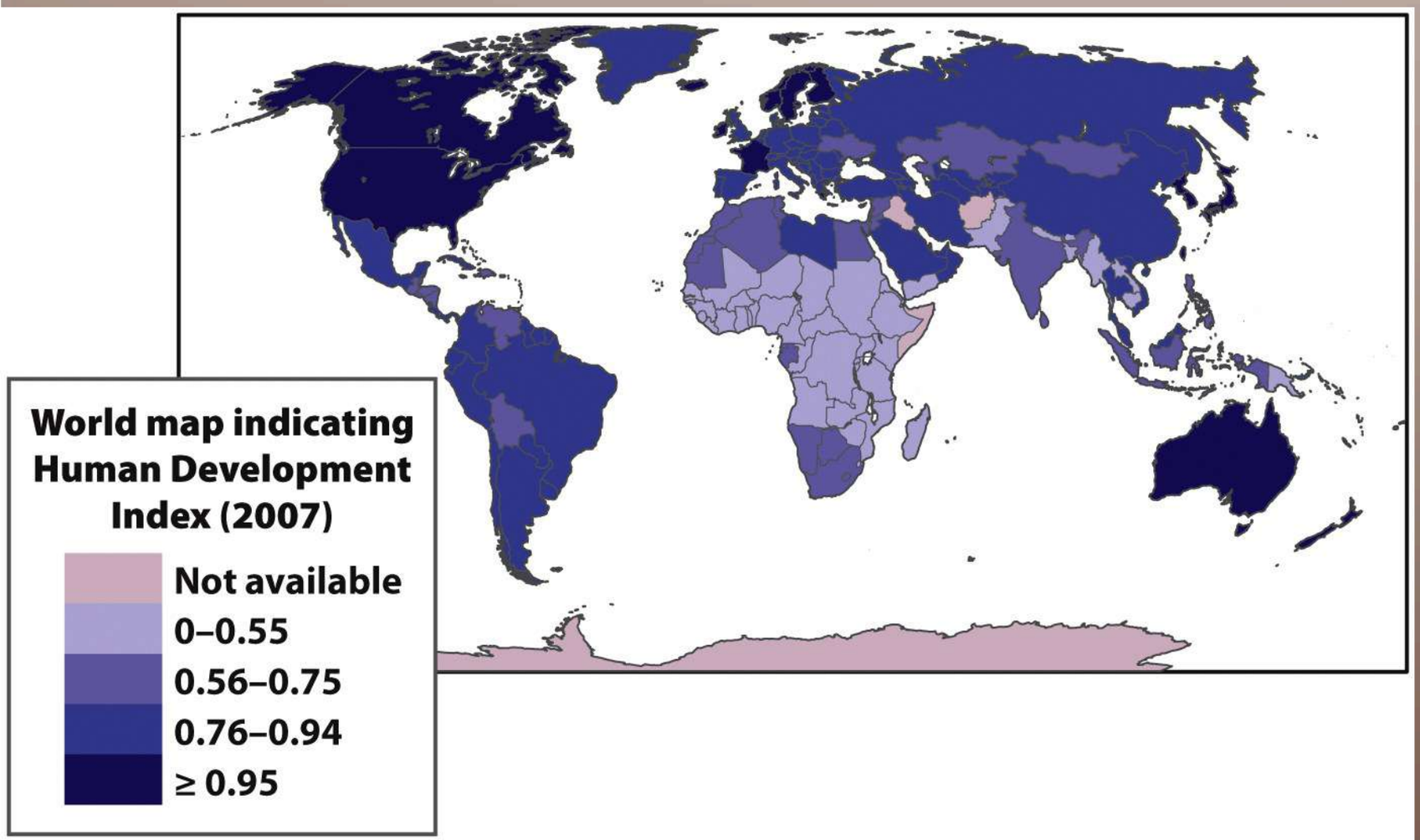

Figure 20.11
Environmental Science

HDI
Three Measures of human status:

- Life expectancy
- Knowledge & education
- Standard of Living


ARCTIC OCEAN
Greenland
Svalbard (Nor.)
ARCTIC OCEAN
United States of America
Canada
Iceland
Norway
Sweden
Finland
Russia
United Kingdom
Ireland
Denmark
Neth.
Ger.
Pol.
Estonia
Latvia
Belarus
Ukraine
Kazakhstan
Mongolia
France
Spain
Portugal
Italy
Rom.
Bulgaria
Georgia
Azer.
Turkm.
Uzb.
Kyrgyzstan
Tajikistan
Turkey
Greece
Tunisia
Syria
Lebanon
Iraq
Iran
Afg.
Pakistan
China
N. Korea
S. Korea
Japan
Nepal
Bhutan
Laos
Taiwan
India
Bangl.
Burma
Thailand
Vietnam
Philippines
Cambodia
Sri Lanka
Malaysia
Indonesia
Papua New Guinea
Solomon Islands
Fiji
Australia
New Zealand
ATLANTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN
Morocco
Western Sahara
Algeria
Libya
Egypt
Israel
Jordan
Kuwait
Saudi Arabia
U.A.E.
Oman
Yemen
Djibouti
Mauritania
Mali
Niger
Chad
Eritrea
Sudan
Ethiopia
Somalia
Senegal
Guinea-Bissau
Sierra Leone
Liberia
Cote d' Ivoire
Ghana
Togo
Nigeria
Cam.
C.A.R.
Gabon
Dem. Rep. of Congo
Rep. of the Congo
Uganda
Kenya
Tanzania
Angola
Zambia
Malawi
Namibia
Botswana
Zimbabwe
Mozambique
Madagascar
Swaziland
Lesotho
South Africa
Mexico
Guatemala
Honduras
Nicaragua
Costa Rica
Panama
Colombia
Ven.
Guyana
French Guiana
Suriname
Ecuador
Peru
Brazil
Bolivia
Paraguay
Chile
Argentina
Uruguay

Mining Laws CH 8

- Mining Law of 1872
- General Mining Act
- Surface Mining Control & Reclamation Act of 1977
- Surface Mining Act of 1987
- General Surface Mining Act of 1998

Environmental Policy Cycle

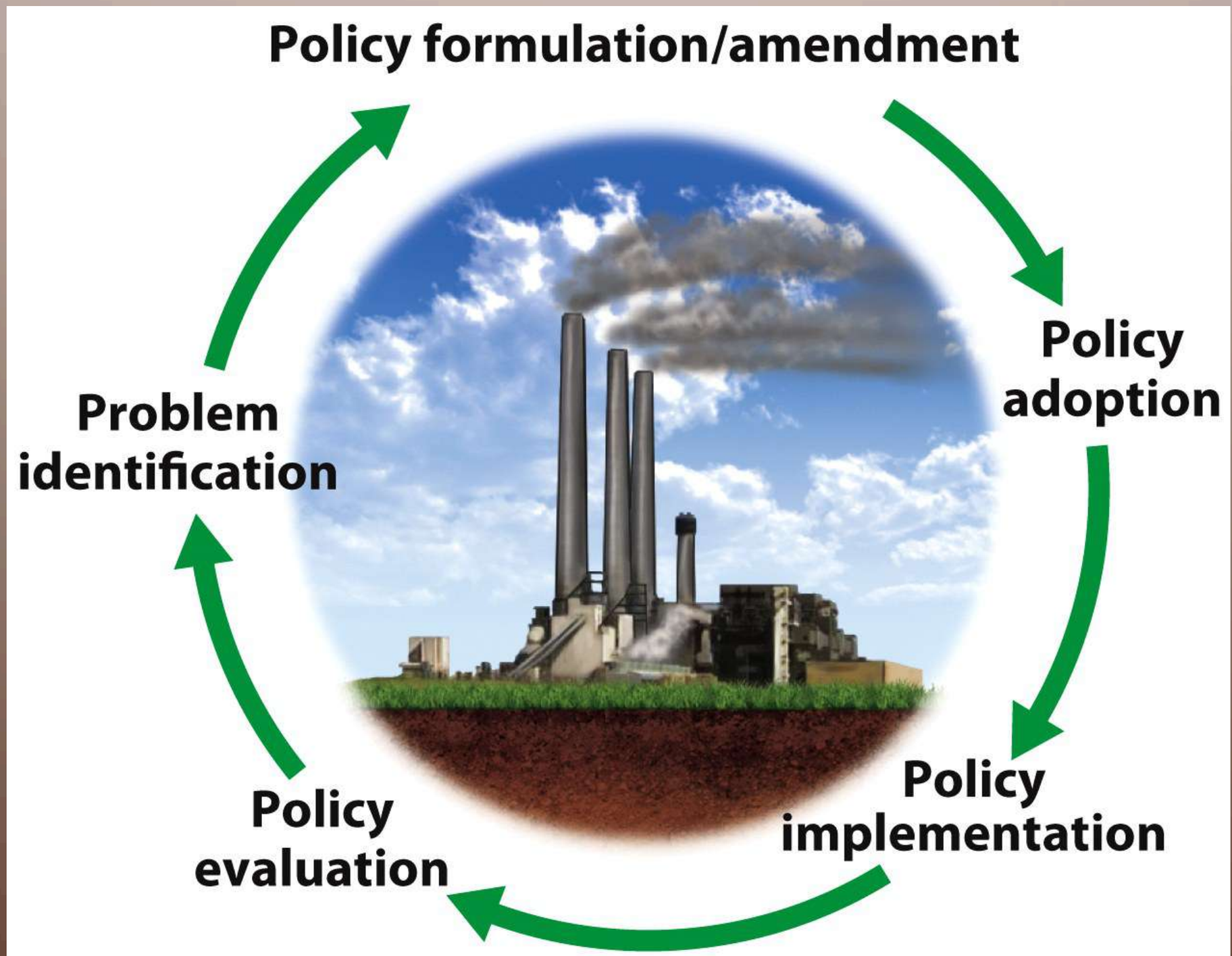

Figure 20.12
Environmental Science

Millennium Development Goals

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Reduce child mortality
- Improve maternal health
- Promote gender equality and empower women
- Combat HIV/AIDS, malaria, and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development

Figure 20.14
Environmental Science

Wangari Maathai
The founder of the
Green Belt
Movement in Kenya.

Environmental Justice

- The inequitable distribution of pollution and of environmental degradation with their adverse effects on humans and ecosystems.
- People that are of lower incomes and minorities that have a disproportionate exposure to environmental hazards.

Individual & Community Action

Figure 20.15
Environmental Science

Nike Grind

Athletic playing surface made from recycled sneakers.

Figure 20.16
Environmental Science

Activity/ HW –Make Flash Cards

- Using P. 562 APES Book make a flash card for every Act, that includes the abbreviation, the year, purpose, and an example of the success.
- I expect you to know these for the fieldtrip Nov. 15th.
- Quiz Each Other

Activity/ HW
Ecological Footprint Calculator p.35 NB

- Log on to the following sites:
- www.epa.gov/sustainability
- www.footprintnetwork.org
- www.myfootprint.org
- After visiting these sites, What choices do you make that are sustainable and Env. Consciencious, which ones are not? What about your family? What about the City of West Sacramento?

TABOO

- Sustainability
- Economics
- Supply curve
- NAFTA
- Kuznets Curve

Taboo

- Externalities
- Demand
- Equilibrium
- GDP
- GPI
- EPA

Sustainability FT

- On the back of your Post Trip Survey Draw what Sustainability looks like to you or draw something you can do to be more sustainable.

Working Toward Sustainability

- Reuse a Sneaker P. 566 ESBK