



Chapter 2: Resources, Environment, and Economic Development

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Focus Questions

- ▶ What is the relationship between economic growth and the environment?
- ▶ Will economic growth encounter planetary limits?
- ▶ How can economic development become environmentally sustainable?

Quick Summary

- ▶ Economic growth over time shows BOTH population AND per capita GDP growth
- ▶ 1950-2010: 2x population, 3x world agriculture production, and 4x world GDP and energy use
- ▶ If this growing population continues, will show greater demand on resources
- ▶ This leads to attempts for sustainable development, in which we have enough resources for everyone and to not run out soon. (Now have potential plans but none are in motion)

Brief History of Economic Growth

- ▶ For a long history of time, human population remained highly stable (meaning numbers did not dramatically increase/decrease)
- ▶ However, the increase of market economy and technology changed this dramatically
- ▶ *Malthusian Hypothesis*: theory proposed (in 1798 by Thomas Malthus) that population would eventually outgrow available food supplies.

Measuring Growth Rates

- ▶ *Gross Domestic Product* (a.k.a. GDP) is the total value of all final goods and services produced within a national border in a year

- ▶ It is measured with the following calculation:

$$\text{GDP} = (\text{Population}) \times (\text{per capita GDP}^*)$$

[*the annual change in per capita GDP in percentage]

- ▶ Two different types:
 - ▶ Real GDP: GDP corrected for inflation using a price index
 - ▶ Nominal GDP: GDP measured using current dollars

Factors essential to economic Growth

- ▶ Investments make possible of growth of capital stock over time.
- ▶ *Capital Stock*: the existing quantity of capital in a given region. Includes manufactured, human, and natural capital
- ▶ Economic growth of a region relies on 3 main factors:
 - ▶ Energy Supply: oil, natural gas, coal, etc
 - ▶ Natural Capital: supplies of land and natural resources, activities such as agriculture that require land is an example
 - ▶ Absorptive capacity of the environment: ability of an environment to absorb and render harmless waste products

Growth optimists and Pessimists

- ▶ Optimists: always see bright side of events. Here, seeing that technological advances can lead to lead to new sources of energy and overcoming any resource limitation



- ▶ Pessimists: seeing the negative, side effects. Say that rapid growth of population and GDP will overshoot the earth's capacity to sustain economic activity

Summary of recent growth

- ▶ With recent mention of growth in population between 1950-2010, increased demands for food, living space, and consumption goods put increased pressure on land, water, resources and the atmosphere
- ▶ Most can be seen even in daily life today, land degradation, depletion of water supplies, forest loss, ecosystem decline, and climate change

The future of Economic Growth and the Environment

- ▶ Only during the last 20th century did environmental issues become prominent
- ▶ Key factors that Economic growth has caused includes:
 - ▶ Population growth
 - ▶ Rising resource demand
 - ▶ Dwindling Resources
 - ▶ Increasing Energy Use
 - ▶ Pollution

Population Growth

- ▶ Although some countries, ie. Japan and some places in Europe, show declining populations, most of the world is facing growing population
- ▶ This could only be changed if a huge death rate increased to hinder growing population (plague or global AIDS crisis)
- ▶ *Intensification of production*: to meet demand of growing population production rates will have to increase even with a limited supply of resources, such as increasing agricultural yield per acre

Rising Resource Demand/ Dwindling resources

- ▶ Together since both should be done side by side
- ▶ *Nonrenewable resources*: resources that are available in fixed supply. Theory shows that these should not be exploited and finished
- ▶ *Resource Recovery*: mining or extraction of resources for economic use. If too much mining is done then goes as dwindling what resources we have left
- ▶ *Overharvesting of renewable resources*: states of harvest that decrease stock/population over time
- ▶ Examples would be overfishing, not letting fish reproduce fast enough

Increasing Energy Use/ Pollution


- ▶ Issue arises with energy use as we have a limited supply of fossil fuels
- ▶ Coal reserves last much longer, but are “dirtiest” of fossil fuels
- ▶ Growing economic growth brings the problem of growing volume of cumulative pollutants
- ▶ *Cumulative Pollutants*: pollutants that do not dissipate or degrade significantly over time
- ▶ An example would be China beginning to handle with their severe pollution problem

Approaches to Economic Growth

- ▶ *Environmental sustainability*: the continued existence of an ecosystem in a healthy state. This is our goal if we approach economic growth Ecologically
- ▶ *Sustainable development*: development that meets the needs of the present without compromising the ability of future generation to meet their own needs. This is also seen to not deplete essential resources that may be needed for the future

Sustainable development

- ▶ With Population: limiting population growth is a critical element in successful development
- ▶ With Agriculture: go back to traditional, yields less but all agriculture now relies heavily on fossil fuels
- ▶ With Energy: Technological advances in solar, wind, and biomass would help increase energy supply
- ▶ With Natural Resources: proper incentives should be promoted to sustain environments. Examples fisheries or forests should not be near depletion.



The End!
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