Lecture 29, 06 December 2005
Conservation
Economics
Sustainability
Evaluations

Conservation Biology
ECOL 406R/506R
University of Arizona
Fall 2005

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Kathy Gerst

Conservation Biology 406R/506R
1. Creativity Recap (items in my office)
2. Economics (Van Dyke, Chapter 12)
3. Evaluations

Final Exam
(1100-1300h Tues 13 Dec 2005 in this room)

Economics of Conservation  Van Dyke Ch 12
1. Economics, Sustainability
   -Herman Daly
   -Wendell Berry

   -Population
   -Consumption
   -Economies
   -Assumptions and Goals
   -Externalities
   -Genuine Progress Indicator

Exponential Growth
Human Population Growth

Conservation in Vietnam
Zeb Hoban
SE Asian fishes, NPR
Hans-Werner Herrmann
BSE 225 Wed 1-2pm
Conservation in Vietnam

Thursday, December 1, 2005
Forbes lobby
noon-2 pm
1 million people added every 5 days

Demographic Transition

harsh

Most developing countries

Much of Europe

Age Structure Diagrams
- note age of reproduction
- currently 30% under 15 (~1.7 billion)

Environmental Impact = Population \times Affluence \times Technology
(of a society)

Developed Countries
1.2 billion people (~19%)
high average per capita purchasing power
have 85% world's wealth
use 88% natural resources
generate 75% waste and pollution

Developing Countries
81% of the people
have 15% world's wealth
use 12% world's natural resources
produce 25% waste and pollution

Poor parents in a developing country need to have 70-200 children to equal the impact of 2 U.S. children

I = PAT
(Paul Ehrlich)
Traditional Neoclassical Economics:

Economy = system of production, distribution, and consumption of goods and services (scarcity)

Driven by wants and needs of govt, society, individuals

Decisions about
A. what goods and services
B. how produce
C. how much
D. how distribute
are made by individuals, governments, businesses

Use resources:
A. natural
B. human
C. financial
D. manufactured
to make goods and services

Internal Market Costs
vs. Externalities
- External to Market Forces
- Noise
- Pollution
- Acid rain
- Erosion
- Global Warming
- Eutrophication
- Disease
- Asthma
- Birth Defects
- Behavior and Intelligence

What is the purpose of the economic system?
- to what end all of this wealth? Ultimate value beyond market?

1- NeoClassical Economics (growth always good)
2- Environmental Economics (catch-all term, think cyclically)
3- Steady-State Economics (John Stuart Mill 1700’s, Herman E. Daly)
   - In = Out
   - ‘Virtue and character higher goals than material wealth.’
4- Sustainable Development (Lester Brown)
   - do away with many subsidies
   - replace income tax with environmental tax

Stocks and Flows, \( \rightarrow \) Entropy
Nicolas Georges-Roegen
- “A Cadillac now means fewer human lives later”
Utility vs. Throughput
Economic Growth vs. Development
- Efficiency, sophistication, utility

[Nonrival (air to breathe) or nonexclusive goods (UV protection from ozone)]

- Producer Pays/Polluter Pays
- Dramatically less waste (packaging, scrubber sludge)
- Taxation/Subsidies
- Pollution Rights
- Precautionary Principle

Government strategies and regulation
- Stable, democratic government required?

Product itself

(VanDyke p. 356:)
NEPA, ESA, Clean Air, Clean Water...
- Work b/c require full and open disclosure of process and those involved.
- How do Cheney secret meetings with industry leaders to plan energy policy fit in?

SDCP and findings from economic analyses...

Herman Daly
Former Environmental Economist with Worldbank
Professor at U. Maryland

Utility vs. Throughput
Utility not measurable; it is an experience

Circulatory system vs. digestive system
(perpetual motion machine)

Wealth vs. Illth (accumulation of goods vs. bads)

Micro vs. Macro economics
(MR=MC vs. endless)

If resources infinite then price = 0,
but if pay for resources then can redistribute wealth

Center for the Advancement of the
Steady State Economy

http://www.steadystate.org/index.html
Index of Sustainable Economic Welfare
(p. 355 Van Dyke 2003)

1. Income Distribution
2. Net Capital Growth
3. Natural Resource Depletion/Environmental Damage
4. Unpaid Household Labor
   (social and environmental justice)

Positive Discount Rate

Conventional Neoclassical Economics
- Private Property
- Economic Growth always good
- Allocate based on price
- More always better for an individual
  (utility curves)

Genuine Progress Indicator
Index of Sustainable Economic Welfare

2nd Law of Thermodynamics

utility curves
4 SPIKES

1. Global Climate Change
2. Extinction
3. Consumption
4. Population

Personal, Local, National, Global

Table 3.1: Ecosystem Services and Functions

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecosystem service</td>
<td>Description</td>
</tr>
<tr>
<td>Carbon fixation</td>
<td>Photosynthesis of CO₂ by plants and algae, which reduces atmospheric CO₂.</td>
</tr>
<tr>
<td>Water supply</td>
<td>Natural supply of freshwater for human, animal, and plant use.</td>
</tr>
<tr>
<td>Water quality</td>
<td>Protects from pollution and contamination, ensuring clean drinking water.</td>
</tr>
<tr>
<td>Pollination</td>
<td>Facilitates the movement of pollen from male to female reproductive parts.</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>Supports a variety of species, including endangered and threatened species.</td>
</tr>
</tbody>
</table>

Thanks to Kathy Gerst

Evaluations