

HWC 201 – UNIT 2 – THE ENVIRONMENT –

Outline for The Environment– An Overview

The century to come will be the environmental century....The issue is not growth versus no growth, but what kind of growth and where....Converting the economy of the twentieth century into one that is environmentally sustainable represents the greatest investment opportunity in history...No challenge is greater, or more satisfying. – Lester R. Brown and Christopher Flavin

I. Overview and Introduction

- A. Overview of Unit** – In this unit—environmental issues and concepts – 1) application of scientific thinking; 2) *interaction/connection* of science and broader culture and society
- B. Finite Global ecosystem** – 40% of the world's primary productivity directed towards humans; meaning?
- C. Sustainability** – something is sustainable if it doesn't undermine the conditions or processes it is dependent on—analogy: living off the interest on an investment; need to apply this to our planet
- D. Seventh Generation Philosophy** – The Chiefs are instructed that when they deliberate on the serious matters of the Council, *they are to consider the impact of their decisions on the seventh generation into the future.* – from the Iroquois (Haudenosaunee) – the Six Nations Confederacy (considered by some to be the oldest participatory democracy on Earth)

II. Human Population Growth – the most pressing environmental problem – all other problems flow from this – a future lecture

At the *current rate*, the world's population will double in approximately **50 years**, but.....

– World population has *more than doubled* during your professors' lifetime

"We shouldn't delude ourselves: the population explosion will come to an end before very long. The only remaining question is whether it will be halted through the humane method of birth control, or by nature wiping our surplus." – Paul Ehrlich

If the present rate of increase continues, during your lifetime one of several things will happen:

- 1) the number of people on earth will at least double (with environmental and quality of life consequences)
- 2) the world will experience an unprecedented population crash, with large numbers dying prematurely
- 3) we can utilize humane methods to control the number of people

III. Some specific environmental issues of concern

- A. Global atmospheric change** – ozone depletion; global warming—climate change; cause? questions
Analogy of insurance; focus of our next lecture
- B. Environmental contamination, pollution, toxins, and associated problems** (examples)
Pesticides—chlorinated hydrocarbons; biodegradability, unanticipated/unintended consequences, Rachael Carson, ecological indicators (canaries in a coal mine), biological concentration; synergistic effects, circle of poison, hormone mimics/endocrine disrupters—reproductive abnormalities; cancer rates
Mercury – Minamata, Texarkana, fish
For the first time in the history of the world, every human being is now subjected to dangerous chemicals from the moment of conception until death – Rachael Carson
Today everybody is downwind or downstream from somebody else – William Ruckelshaus
- C. Energy** – In the U.S. – addiction to high usage of non-renewable fossil fuels; U.S. 4.6% of world pop. uses 24% of commercial energy; India 17% of world pop. » 3% of energy; downsides of U.S. energy usage: CO2 emissions; national security; economics (balance of payments)
– What do we do? increase supply vs. renewable options vs. conservation strategies
– the nuclear question – no new nuclear plants ordered in the U.S. since 1978—Why?
- D. Loss of Biological Diversity** – another global problem – all the species we share the planet with—another lecture
- E. Water – access to water resources** – a looming global and local issue (e.g., Middle East, sw U.S.)
– *It is not until the well runs dry that we know the worth of water.* – Benjamin Franklin
- F. Topsoil** – currently we are using topsoil unsustainably; rate of loss is much greater than formation; “mining” of topsoil; implications for agriculture in the future
- G. Decline in Fisheries**
Estimated that 1 billion people rely on fish and shellfish as primary protein source; 2/3 of world's poorest people get 40% of their protein from fish; total per capita fish catch decreased 9% from 1989-93
(Examples: Peruvian anchovy—collapsed in 1972, commercially extinct; Atlantic Cod—catch dropped 95% from 1972 to 1992, now a moratorium on fishing off Newfoundland, Canada, social collapse); have we reached a limit in terms of fish? over-fishing; pollution; destruction of wetlands; bycatch
Who pays the consequences of environmental degradation? global vs. local examples
Concept of **Sustainable Yield** - size of annual catch that can be harvested indefinitely without a decline in the size of the population; complex systems—recovery not certain after a collapse

IV. Tragedy of the Commons (overuse of common property resource) – Garrett Hardin–1968

Commons – owned by none and available to all free of charge; **global commons**

In the short run, the more an individual uses a shared resource, the better off he/she will be; long run ruin (examples: grazing on commons; Atlantic Cod; air & water pollution; ozone depletion; global warming)

V. Ubiquitous tension between short term interest of a few and long term interest of everyone

VI. The concept of Ecosystem Services – nature provides us with valuable services

- A. Definitions:** 1) the fundamental life-support services provided by natural ecosystems, without which human civilization would cease to thrive.
2) the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life.
- B. Could also be called Ecosystem Maintenance/Life Support Services**
- C. Examples:**
- | | |
|---|--|
| purification of air and water | mitigation of droughts and floods |
| generation and preservation of soils | detoxification and decomposition of wastes |
| pollination of crops and natural vegetation | cycling and movement of nutrients |
| control of majority of potential agricultural pests | maintenance of biodiversity |
| protection of coastal shores from erosion by waves | protection from the sun's harmful UV rays |
| moderation of weather & climate | |
- D. How are these valued by society? They do not fit our standard economic and social models – e.g.: externalities; Result is failure to encourage sustainability and maintenance of systems that provide us with ecosystem/life-support services**
- E. Quote: National security is a meaningless concept if it does not include the preservation of livable conditions within a country—or on the planet as a whole. Environmental degradation imperils nations' most fundamental aspect of security by undermining the natural support systems on which all of human activity depends – Michael G. Renner**

Additional Environmental Quotes:

What has gone wrong, probably, is that we have failed to see ourselves as part of a large and indivisible whole....We have failed to understand that the earth does not belong to us, but we to the earth. – Rolf Edberg

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect. – Aldo Leopold

The last word in ignorance is the person who says of an animal or plant: "What good is it?" ...If the land mechanism as a whole is good, then every part of it is good, whether we understand it or not....Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left – Aldo Leopold

If we love our children, we must love the earth with tender care and pass it on, diverse and beautiful, so that on a warm spring day 10,000 years hence they can feel peace in a sea of grass, can watch a bee visit a flower, can hear a sand piper call in the sky, and can find joy in being alive. – Hugh H. Iltis

If the United States wants to save a lot of oil and money and increase national security, there are two simple ways to do it: stop driving Petropigs and stop living in energy sieves. – Amory B. Lovins

Tug on anything at all and you'll find it connected to everything else in the universe. –John Muir, Founder Sierra Club

Earth provides enough to satisfy every man's need, but not every man's greed. – Mohandas K. Gandhi

The ultimate test of man's conscience may be his willingness to sacrifice something today for future generations whose words of thanks will not be heard. – Gaylord Nelson, former governor of Wisconsin, founder of Earth Day

We cannot solve the problems that we have created with the same thinking that created them. – Albert Einstein

Our task must be to free ourselves by widening our circle of compassion to embrace all living creatures and the whole of nature and its beauty. – Albert Einstein

If future generations are to remember us with gratitude rather than contempt, we must leave them more than the miracles of technology. We must leave them a glimpse of the world as it was in the beginning, not just after we got through with it. –President Lyndon B. Johnson (Upon signing of the Wilderness Act, 1964)

We travel together, passengers on a little spaceship, dependent upon its vulnerable reserves of air and soil, all committed for our safety to its security and place, preserved from annihilation only by the care, the work and, I will say the love we give our fragile craft. – Adlai Stevenson

Treat the Earth well. It was not given to you by your parents. It was loaned to you by your children. – Kenyan Proverb