17.181 / 17.182 Sustainable Development: Theory and Policy

Spring 2009

What is Sustainability?

- **The ability of humanity to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. [Bruntland, 1987]**
- **Preservation of productive capacity for the foreseeable future. [Solow, 1992]**
- **Biophysical sustainability means maintaining or improving the integrity of the life support system of earth. [Fuwa, 1995]**
- **A dynamic harmony between the equitable availability of energy-intensive goods and services to all people and the preservation of the earth for future generations [Tester, et al. 2005]**

Are There Limits to Growth?

- **Malthus – 1798 – Population grows exponentially; food production grows linearly. Population growth ceases when incremental person doesn't have resources to survive**

- **Hardin – 1968 – Tragedy of the Commons**

- **Ehrlichs – 1968 – Overpopulation is the problem, depleting soils and disrupting natural life support ecosystems**

- **Forrester – 1972 – Limits to Growth – potential for disaster within 100 years**

- **Meadows – 1992 – Beyond the Limits – overshoot but human ingenuity could prevent collapse**

- **Cohen – 1995 – How many people can Earth support? (maybe a trillion, more likely around 16 billion)**

Prepared by E. Drake, MIT Energy and Environment Lab. 2006

What are the major material concerns?

- **Global Energy consumption is growing because:**
  - **Population is growing**
  - **Energy use per capita is growing – especially in developing countries**

- **Major fossil energy sources have problems**
  - **Security of supply/price stability (esp. petroleum)**
  - **Depletion concerns**
  - **Climate impacts**

- **Energy access is unequally distributed**

- **Global economy is dependent on present levels of fossil energy prices & availability – change will slow economic growth**

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One: Governance Matters

- Effective governance systems are essential – necessary but not sufficient – for managing entities under stress
- Almost all developing countries are already under stress
- Strengthening governance and institutional performance is a necessity not a luxury

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Relationship Between Institutional Quality & National Income

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Source: World Bank. World Development Report, 2003. pg. 43

Equal, Population-Based, and Wealth-Based Voting Formulas

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Source: Rourke, John T. *International Politics on the World Stage*. McGraw-Hill, 2002. pg. 246

Evolution of Water Withdrawals Through the Twentieth Century
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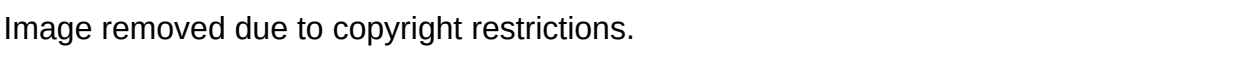
Source: Mostafa K. Tolba et al. 1992. *The World Environment 1972-1992: Two Decades of Challenge.* London: Chapman & Hall.

World Populations in Developed and Developing Countries: 1950-2050



Vertical and Horizontal Linkages in the Context of Indicators of Sustainable Development

Countries at Risk of Conflict

Global map of conflict risk

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Source: Mapplecroft Maps

Former Yugoslav Citizens with Temporary Protection in Europe

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The State of the World's Refugees. United Nations High Commissioner for Refugees. Oxford University Press.. 1995

Intragenerational Principles

- **Reduce gross inequities between the poorest and wealthiest both nationally and globally**
  - **Meet the basic needs of the poorest with food, shelter, health care, clean water, access to electricity, education, opportunity for work, etc.**
  - **Avoid exploitation of poorer country/region resources and labor to create even greater wealth for the richest**
- **Provide ways to protect the common good (social, environmental, economic) locally and globally through national and international governance/cooperation**
  - **Preserve natural ecosystems against unconstrained development**
  - **Avoid interference with natural balances in the atmosphere, the oceans, and the arctic regions**
  - **Maintain stable institutions that protect human rights, adjudicate conflicts, and allow responsible trade and market economy activities**

Intergenerational Principles

- **Trustee: Every generation has an obligation to protect interests of future generations**

- **Chain of obligation: Primary obligation is to provide for the needs of the living and succeeding generations. Near term concrete hazards have priority over long term hypothetical hazards**

- **Precautionary Principle: Do not pursue actions that pose a realistic threat of irreversible harm or catastrophic consequences unless there is some compelling or countervailing need to benefit either current or future generations**

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The Core – High Level Definition

We define sustainable development as:

- **The *process* of *meeting* the needs of current and future *generations***
- **Without undermining**
- **The *resilience* of the life-supporting properties of nature and the *integrity* (or cohesion) of social systems".**

What are the properties of this definition?