17.181/17.182
Fall 2016
Sustainability:
Political Economy, Science & Policy

The Course is in Three Parts

Part I
Content & Context

PART II
Actors, Processes & Institutions

Part III
Strategic Issues

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Week 1
Introduction

1. **INTRODUCTION**
   - Background
   - Early Views
2. **WORKING DEFINITION**
   - The Core
   - The Extensions
   - The Processes
3. **THE PROPOSITION**
   - Statement
   - The Implications
4. **THE NEW ISSUES**
   - Climate Change
   - Cyberspace
5. **THE REALITY QUESTION**

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1. Introduction

The view of sustainable development in this course:
Centers on **human activities,** and places human beings in **social systems** at its core, embedded in **the natural System -- a**nd now the **cyber system.**

Sustainable development is **driven by events** in the real world – not by revolution in academia or by theoretical conditions

- **Forced to reconsider** the theoretical foundations growth models.
- **Different views** depending on situation

Background Variety of Views

- **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]**

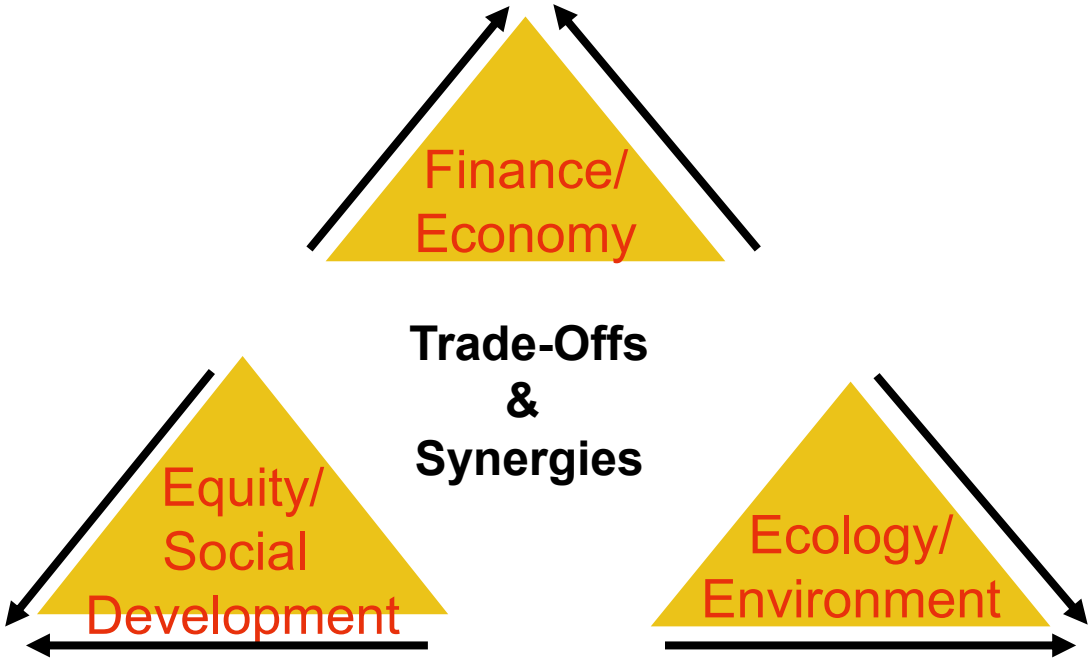
- **Preservation of productive capacity for the foreseeable future. [Solow, 1992]**

- **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]**

Conventional Dimensions of Sustainability

What do you think of this?



Derived from World Bank (1996)

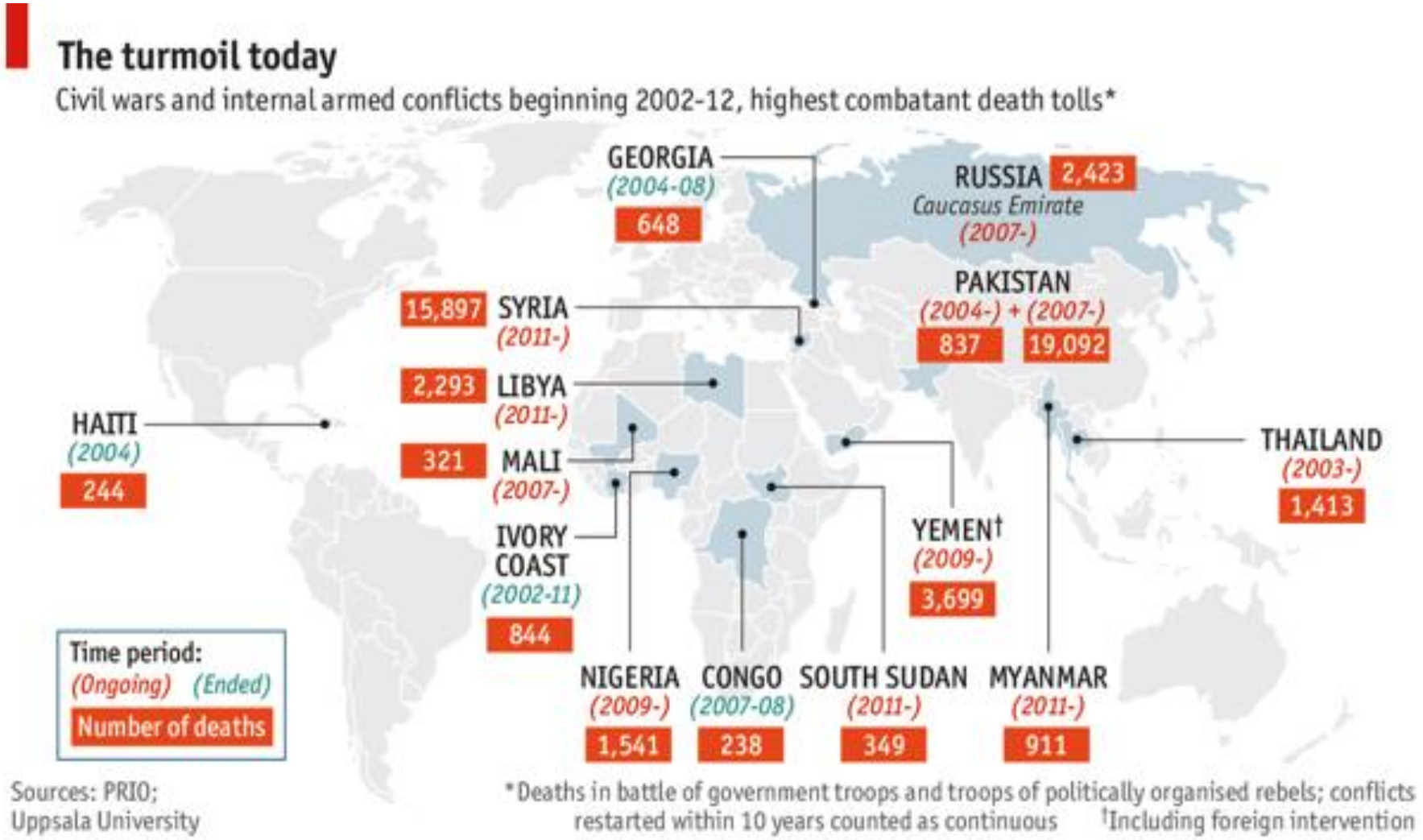
What are major concerns?

- **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 fossil fuels**
- **What else?**

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)

Sustainable Systems or Collapsing Societies?



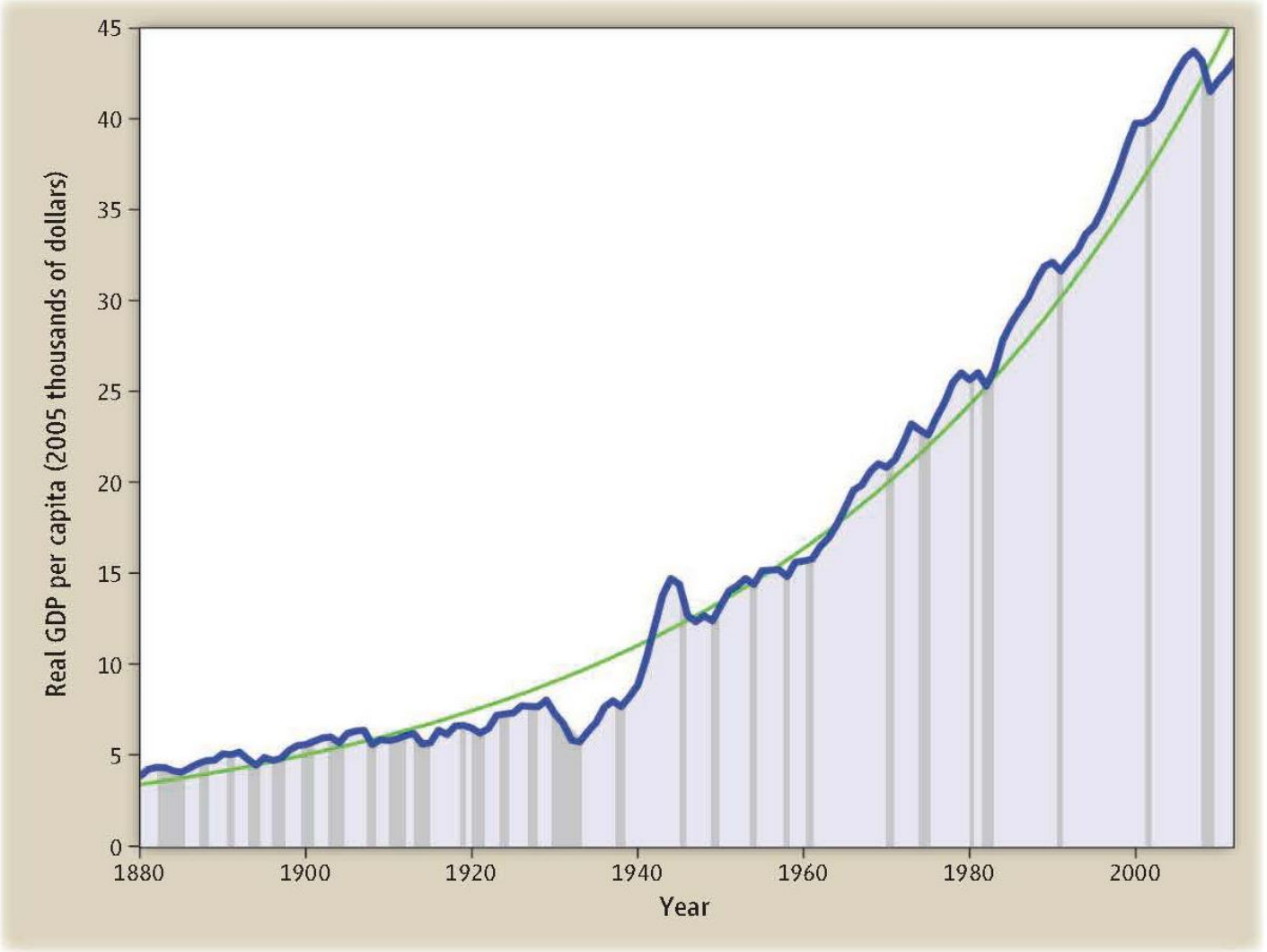
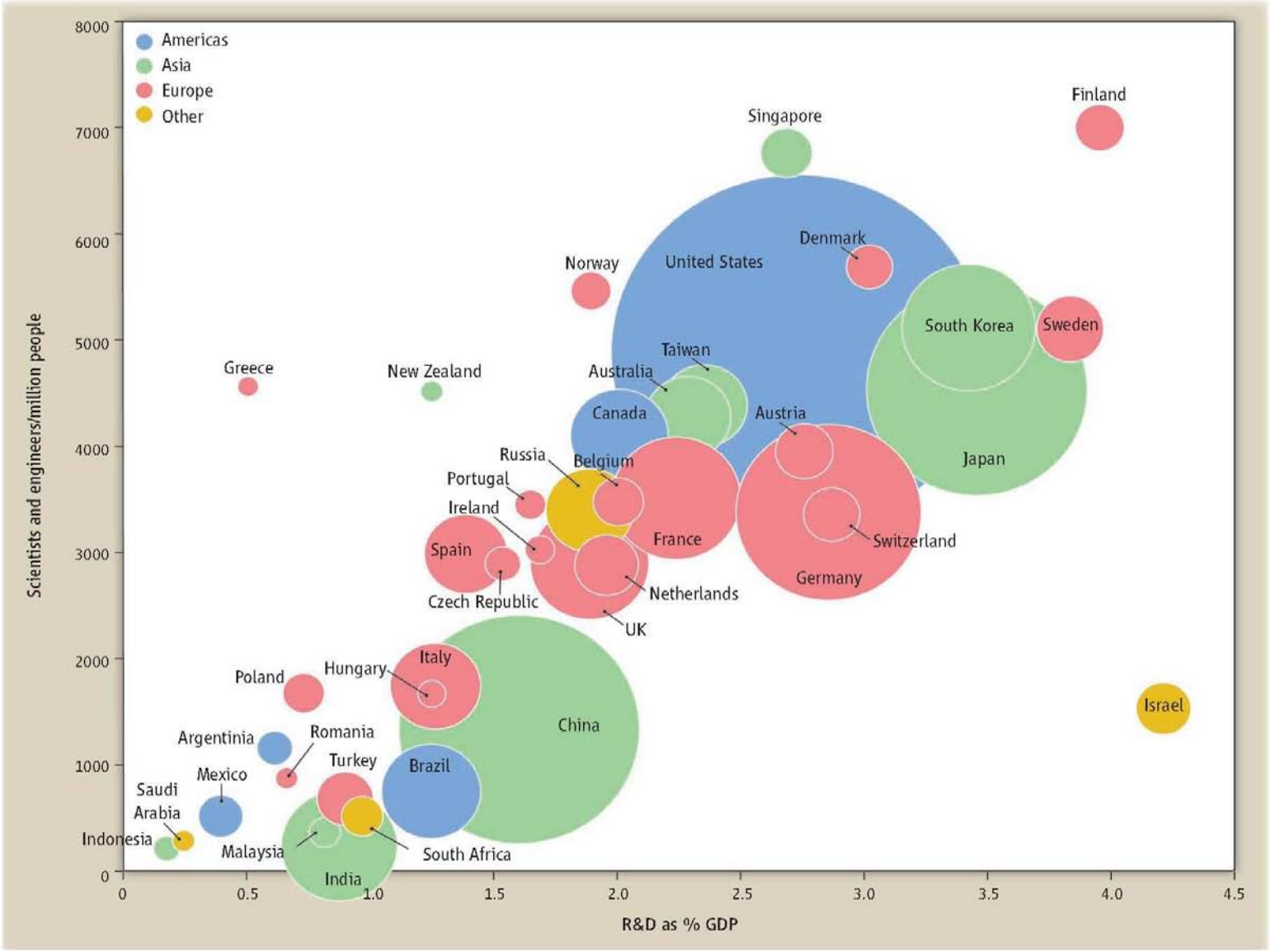


Fig. 1. U.S. GDP per capita, corrected for inflation in 2005 dollars. The smooth green curve is an exponential fit to the data. Shaded date ranges show official periods of recession. On average, an individual's income in the United States has increased by about 2% per year for more than 130 years.



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2. The Working Definition:
Conceptual 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?
What's missing?

The Extensions

Extending this definition further we differentiate among four **fundamentals of sustainability** as follows:

- **Ecological** configuration
- **Economic and social activity -** production and consumption
- **Governance** and politics
- **Institutional capacity** and performance

The Processes

These are not discrete outcomes—which consist of:

- Ecological systems exhibiting
  balance and resilience

- Economic production and consumption with
  equity and efficiency

- Governance and politics with
  participation and responsiveness

- Institutional performance demonstrating
  adaptation and feedback

The Complexities

- Logic of interdependence
- Feedback dynamics
- Emergent properties
- Linkages & networks
- Transmission mechanisms
- The power of knowledge
- Policy goals and policy Levers

Potential Transformations

- DE-MASSIFICATION
- DE-CENTRALIZATION
- DE-SPACIALIZATION
- DIS-INTERMEDIATION
- DIS-AGGREGATION
- DE-NATIONALIZATION

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