17.181 / 17.182 Sustainable Development: Theory and Policy

Spring 2009

Sustainability as a Knowledge Domain

17.181-17.182

Week 3 Outline

I. REVIEW and COMMENTS

Definitions & Key Features
Challenges to Sustainability Theory
Why Systems Collapse – Tainter (first pass)

II. SUSTAINABILITY SCIENCE

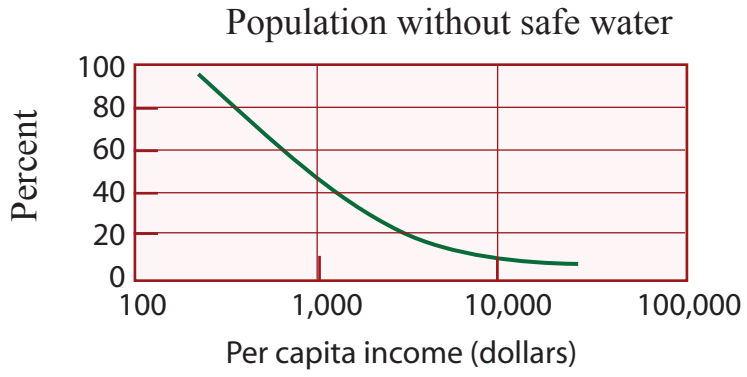
Defintion
Goals

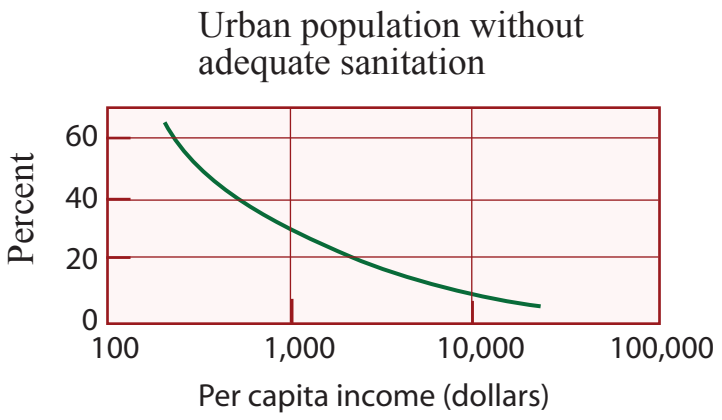
III. SUSTAINABILITY as a KNOWLEDGE DOMAIN

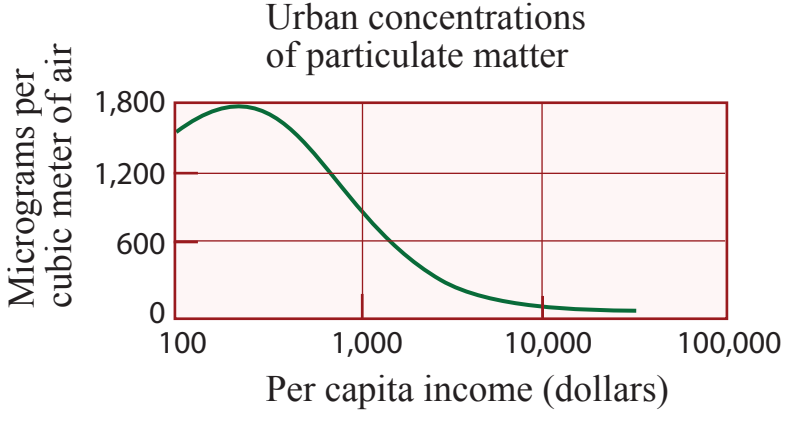
Knowledge Transition
Knowledge Systems
Knowledge e-Barriers
Solution Strategies to e-Barriers

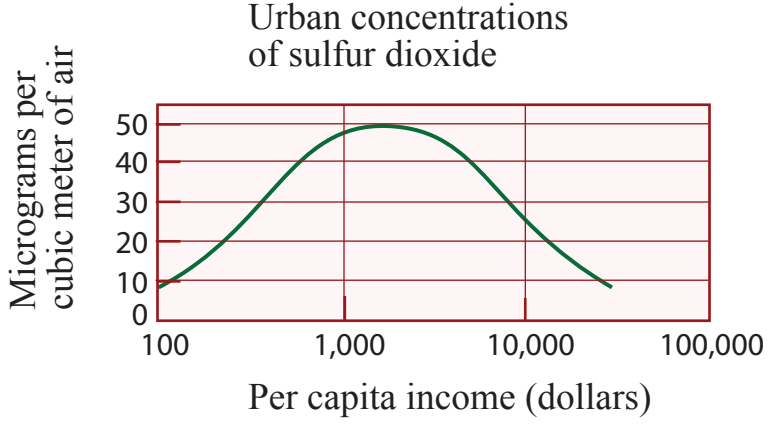
IV. INTRODUCTION to GSSD

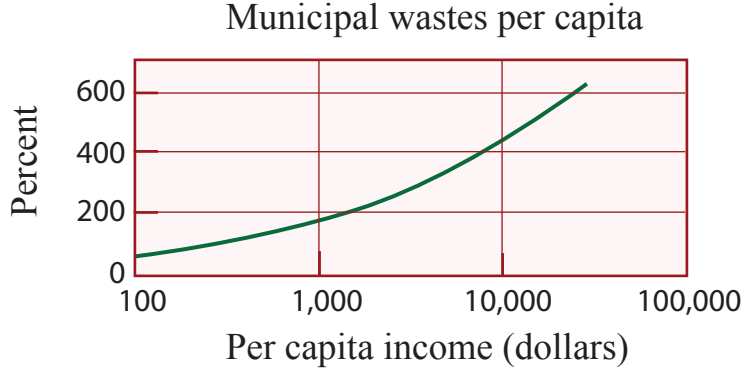
I. Review and Comments

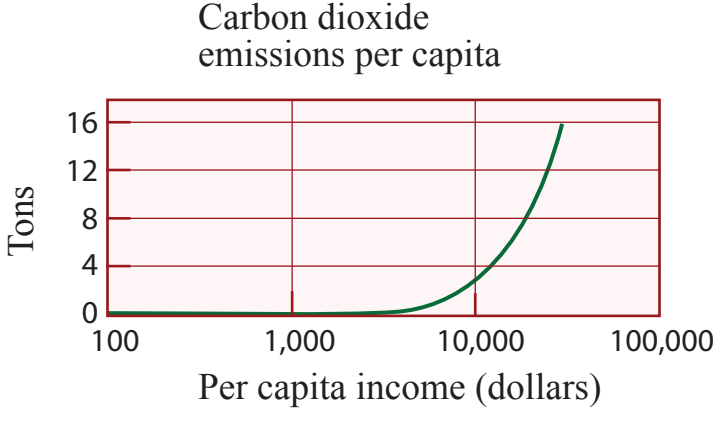












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Themes that Explain Collapse

According to Tainter

Each of the items below are listed as separate causal factors in his book (p. 43). A such we cannot see any theory dynamic logic. But if we begin to group the items, and imply some logic, a form of 'theory' emerges*.

(1) *Resource Constraints*

- **Depletion**
- **New resource Base**
- **Economic Factors**

(2) *Social costs*

- **Class conflict, elite mismanagement**
- **Social dysfunction**

(3) *Persistent Pressures*

- **Catastrophe**
- **Insufficient responses**

(4) *Beliefs & Chance?*

- **Mystical Factors**
- **Chance and events**

(5) *External Threats*

- **Other complex systems**
- **Intruders**

Source: Tainter, 1968, p. 43

Alternatives to Collapse – Proposed to the Class (NC)

- Knowledge as problem solving
- Knowledge as problem creation
- Anticipatory tools and behaviors
- Technological investments
- Increased efficiency
- Can we recognize too high marginal costs?

ONCE MORE:

Requisites for Sustainable Development

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

Source: J.S. Brown and P. Druid, *The Social Life of Information* (2000)
Hyphen added for emphasis – not in the original

Comments on the TAINTER argument:

Why Investments in complexity yield a declining marginal return

- Increasing size of the bureaucracies
- Increasing specialization of bureaucracies
- Cumulative nature of organizational solutions
- Increasing taxation
- Increasing costs of legitimizing activities
- Increasing costs of internal control and external defense

II. SUSTAINABILITY SCIENCE

Sustainability Science

Advance basic understanding of the dynamics of human-environment systems in order to

Facilitate the design, development, implementation, and assessment of policy and strategy to facilitate transitions to sustainability in localized and globalized contexts particular places and contexts;

Enhance conenctions between (i) research and innovation (ii) relevant policy and management (iii) in national and international contexts.

Source: Based on and extended from US-NAS materials

Goals of Sustainability Science

- **Knowledge structuring**
- **Coordination of data**
- **Multidisciplinary cooperation**
- **Contextualization – of the above**
- **Internationalization – of the above**

Source: Based on and extended from US-NAS materials

Challenges to Sustainability Science Specifying**:

- Nature of the challenge
- System boundary
- System components
- System behavior
- Time horizon
- Normative Underpinnings National & International Linkages
- Institutional Linkages

** **Lecture Notes**