

Summary of Week 3
Long-term Trends and Transitions in Nature and Society
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for
EEB 533b Sustainability Science
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Prepared by: Princeton University Student Group
Sara Avila, Christina Nolfo, Molly O'Connor

Course website: <https://groups.nceas.ucsb.edu/sustainability-science>

Instructor: Lizzie King (egking@princeton.edu)

This summary of the third week of the course *Sustainability Science*, covers the material of the week, including Chapter 2 of *Sustainability Science: An Introduction*, key supplemental readings, remarks by Bob Kates, of Harvard, remarks by Ann Kinzig, of Arizona State University, remarks by Princeton University student discussants, and responses during the class session. The focus of the discussion was on transitions to sustainability. This paper may be expanded, revised or merged with other materials during the course of the semester.

Bob Kates' Remarks, Harvard University

Presenting on chapter 2, Bob Kates argued that studying trends and transitions is important for understanding how the world works. Transitions can be thought of as having three phases: take-off, acceleration, and stabilization. In studying transitions in sustainable development it is important to ask questions about scale and endpoints.

In a semi-log plot of population, he highlights three distinct demographic transitions coinciding with the technology of the Stone Age, Agricultural Age, and the Industrial Revolution (Deevey 1960). In terms of endpoints, Bob suggests examples of transitions that have likely, uncertain, and unknown endpoints. He uses time series and other plots to present an instance of each case (demographics, health, land, and peace).

With this background, Bob introduced the notion of a sustainability transition. He referred to the Millennium Development Goals; the NAS Sustainability Transition; and the Global Scenario Group, Great Transition: three approaches that use different time frames, indicators and objectives in working toward and assessing a sustainability transition. The time-frame at which we assess sustainability is particularly important: if one uses "forever" then most likely nothing will be sustainable; while if one uses "short term" everything appears sustainable.

Bob proposed the following study questions about a sustainability transition to the audience:

1. Is a fourth phase of population growth likely or possible in the future and what would its enabling technology be?
2. How might a transition from continuing growth in consumption take place and what would be its upper level?
3. Do you foresee a sustainability transition, and if so, how long will it take and what would constitute its changes?

Ann Kinzig's Remarks, *Arizona State University*

Ann Kinzig began with the questions: what can the past teach us, and what is fundamentally different and new about today? These two questions are important because while the past can teach us about successes and failures in aligning incentives with sustainable development goals; forecasting is made even more difficult if something about the world is fundamentally new. Ann suggested that some unprecedented traits are human population size, the notion of the “good-life”, relationship between people and technology (“becoming Borg”), and the complexity of institutions. With these new developments in mind, Ann prepared the following responses to Bob Kates’ first two questions about the prospects of future transitions.

To answer question one, Ann described the trends of births and deaths in the past three phases of population growth; then she surmised that a fourth phase would be technology enabled. If technology developments drastically increased the average life-span, it would lower death rates; Ann thinks, however, that this growth would stabilize quickly. The fundamental implications of such a phase would be the costs of raising a family and the difficulties to provide jobs, schooling and livelihood to this many people.

Regarding the second question, Ann emphasized that increased consumption is driven by relative standards of well-being. She said that by evolution or natural selection people have a strong incentive to “want to get ahead” and compare themselves to others. A cultural control or taboo on conspicuous consumption can limit this drive, but it is important to consider that for many people the perception of wellbeing is in relation with others. Therefore when considering a consumption transition, the relative rather than the absolute measurement of well being is relevant.

Student Group's Response, *Princeton University*

In order to respond to Bob's third question about whether a sustainability transition is possible, Princeton University presenters considered the development history of the Developed World (North). Taking into account the unequal exchanges between regions, the discussants questioned the possibility of the Developing World (South) to follow the same path with a time lag. The response was inspired by the quote:

The rich countries have already completed these transitions and other countries are expected to catch up with the leaders overtime.
(Chapter 1.2 Bongaarts, Turner, Kates, 2010)

The discussion approached sustainability transitions by using the concepts of scales, measurement systems, and asymmetric interactions. After noting the main challenges of sustainability measurement systems and giving an example of the asymmetric relationship between North and South Princeton students concluded that interactions between units and indicators determine what conclusions and policies are made on sustainability science. Also, it is important to approach this dilemma in multiple spatial and temporal scales so that particular characteristics are accounted for. Whether there is a real EKC, spurred by an awesome technology, or an unsustainable trend, due to the North exporting environmental degradation to the South, both options have implications for the prospect of a sustainability transition.

Discussion

The majority of the discussion focused on consumption transition and, in particular, on Ann's point about relative standards of well-being. Bob Kates' added the thought provoking question, how does one achieve more knowledge intensive consumption in the future? Participants continued the discussion by providing general commentary regarding how to improve the quality of life globally, how corporations drive consumption practices, and whether races in consumption could be replaced by cooperation in response to shared environmental concern or a sense of catastrophe.

The discussion transitioned into a summary session of university group's responses to Bob Kates' three questions. Concluding remarks from Cornell suggested that new technologies could lead to a fourth phase in population growth and that it is important to consider how the developed world affects the developing world. Harvard noted the example of India where sustainability may be attained through spiritual values in contrast with the materialistic approach. Furthermore, FIU emphasized the dichotomy of North and South and that skewed differences create blind spots. University of Minnesota added that with no sustainability transition there would be another explosion of growth. It was concluded that consumption habits and sustainability transition could largely be driven by what it means to change the quality of life.