

## Appendix A: Pre-trip Assignments China

Global Environmental Sustainability:  
A Field Study in China  
Biology 497C  
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The Pennsylvania State University – Lehigh Valley

### 2011 CHINA PRE-TRIP ASSIGNMENT #1

Selected by *The Globalist* as one of the top ten books of 2004, *The River Runs Black* by Elizabeth C. Economy is the most comprehensive and balanced volume to date on China's growing environmental crisis and its implications for the country's development. Based on historical research, case studies, and interviews with officials, scholars, and activists in China, this book provides insightful analysis of the economic and political roots of China's environmental challenge as well as the evolution of the leadership's response.

Please answer all questions as thoroughly as possible using *The River Runs Black* to guide you on a factual basis, and when applicable, your own thoughts to relay your individual opinion(s). Whenever possible, highlight (discuss) Jiangsu province and and/or specific areas within it like Shanghai, Lake Tai and the Huai and Yangtze Rivers (places that you will be visiting). Also, updated research statistics, beyond 2004, will mark your efforts as exemplary.

It is highly recommended that you purchase a quality map of China to: 1) review geographical areas presented in required pre-trip readings/assignments; and, 2) carry with you throughout your travels while in China as a reference.

#### Chapter 1:

1. List the eight major rivers that run through China.
2. What is the geographic location of the Huai River and its source of water?
3. Describe, in detail, the death of the Huai River.
4. The author states on page 9, "The saga of the Huai River Valley is typical of today's China." Explain.
5. Three broad debates related to China's environment exist till this day. Summarize them.
6. The author states on page 15, "Today, China's environmental practices are overwhelmingly shaped by the dramatic process of economic and political reform that has been transforming the country since the late 1970s." Explain.
7. The "campaign" by the central government to clean-up the Huai River failed. What is meant by campaign here?

#### Chapter 2:

1. Describe how the Ancient Chinese perceived the environment. Be specific.
2. How did Confucianism, Taoism, Legalism and Buddhism expand upon the ancient values? How did these philosophies differ in their basic approaches to the environment? Be specific.
3. Which of these philosophies has been the most influential? Provide specific examples.
4. List and explain some of the environmental problems China had between the Warring States period and the end of the Qing dynasty.

5. *How did the Chinese view population growth? How did their view towards population growth inform their environmental policies?*
6. *What is Mao's environmental legacy? In particular, how did his political views shape his stance towards the environment? Describe "The Great Leap Forward" and "The Cultural Revolution." How did these periods shape China's landscape? Be specific.*
7. *Explain how Mao's rule was in some ways an extension of ancient Chinese values. Be specific.*

### **Chapter 3:**

1. *What is a SOE? What is a TVE? Why has the Chinese leadership diminished the role of SOE's in the Chinese economy, and come to rely on TVEs as the foundation of economic growth?*
2. *How have foreign investments played a role in China's new economy?*
3. *Discuss how China's forests and grasslands have suffered, and how the loss of these essential ecosystems have both local and global consequences.*
4. *What wake-up call was delivered by the Yangtze River in 1998?*
5. *Explain the statement as rigorously as possible, "For many regions in China, diminishing water supplies post today's greatest social, economic, and political challenges."*
6. *Describe the State Environmental Protection Administration (SEPA) 2002 annual report on China's levels of water pollution.*
7. *China is the number one consumer of coal in the world. Exactly, how much does China rely on coal to meet its energy needs? Contrast coal use in Japan, USA, and India.*
8. *What is the problem with small (under 500 MW) coal-fired power plants?*
9. *Elaborate on the reality of China's rapidly growing transportation sector.*
10. *According to the 2001 Fifth National Census, what was China's population? Why are Chinese scholars questioning the accuracy of the census? What are the real concerns behind China's burgeoning demographics?*
11. *Read "Who Will Feed China," written by America's environmentalist Lester Brown in 1994 (hot link on "Outline" page of course web site). Why was this article considered controversial and how did the Chinese government react? How have their companies failed and even worsened the situation?*
12. *Research how much grain China produced each year from 1990 to 2010.*
13. *Unemployed SOE workers and migrant laborers make for a potentially explosive combination in China's cities. Explain.*
14. *What is the life expectancy of a traffic police officer in Beijing, and why? How is this problem affecting children?*
- 15-a. *What are the economic costs of (% GDP) environmental in China in dollars?*
- 15-b. *What are the environmental costs of percent resource or percentage increase in pollution?*

### **Chapter 4:**

1. *Describe how China's environmental policies changed during the period between 1972 and 1992.*
2. *How did the UNCED cause changes in China's environmental governance?*
3. *How has China's legal system hindered change? Be specific.*
4. *How has SEPA's role changed over the years? What is its role now? What are some obstacles it faces?*

5. *What is an EPB? What is their function?*
6. *How have EPB's struggled to enforce laws?*
7. *What are some challenges China's judicial system faces? Be specific.*
8. *What are the implications of China's decentralized system of authority?*
9. *Describe the failures of China's campaign mentality. Provide examples.*

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The Pennsylvania State University**

**2011 CHINA PRE-TRIP ASSIGNMENT #2  
Ecological Engineering and Living Machines**

**Part A – (Dr. Rachel Brennan; rbrennan@engr.psu.edu) Ecological engineering is defined as “the design of sustainable ecosystems that integrate human society with its natural environment for the benefit of both”. The purpose of this assignment is for you to familiarize yourself with the principles of ecological engineering and understand how Living Machines can be used to sustainably restore contaminated water supplies.**

**Questions to consider:**

1. *How do conventional domestic and industrial wastewater treatment plants work? What is their primary source of power? What are some common chemical inputs and waste outputs?*
2. *What are Living Machines? What is their primary source of power? What are their essential physical and biological components and how do they work together to treat contaminated water? How are Living Machines similar and different from conventional treatment plants?*
3. *What are some examples of successful living machines (i.e., where have they been used)? Besides domestic wastewater, what other types of wastes can be treated using living machines?*
4. *What is the “Gaia hypothesis”? What is the relevance of the Gaia hypothesis in ecological design? How could this principle be applied to restore degraded environments, such as the one we will observe in China and others throughout the world?*

**Deliverable:** An 8 – 10 page report (11 point font, double spaced, 1” margins). If you feel the need to go beyond this page limit to satisfactorily meet the objectives of this assignment or to satisfy your own curiosity, that’s ok. Be sure to spell-check and proof-read your final document for grammatical and technical accuracy.

**References:** You are encouraged to use the internet as a good starting point for your research, but your review must also include a minimum of five peer-reviewed journal articles and/or books. The inclusion of graphics and schematics is highly encouraged, but they will not be included in the total page count. Be sure to include a complete reference list at the end of your report, and cite your references appropriately in the body of the text (this includes in the captions of any figures that you use). Use the referencing format of any major journal (for example, *Ecological Engineering*).

**Part B – (Dr. Dave Abler; dave@bnumbers.com) Attached are two of articles on the Environmental Kuznets Curve. Please read both articles and answer the following question:**

**Deliverable -** Define the Environmental Kuznets Curve (EKC) and explain, on the basis of your readings and research, whether or not you believe there is an EKC for water pollution in China. You are encouraged to seek out relevant research beyond the assigned articles. Your answer should be delivered in complete sentences using 11 point font, double spaced, 1” margins. Be sure to spell-check and proof-read your final document for grammatical and technical accuracy.

**Part C (Dr. Jacqueline McLaughlin; JShea@psu.edu)– Please purchase the book, *The Future of Life*, by E.O.Wilson. We will be reading selected chapters of this book while on planes, trains, and in automobile. It will be a key component to several course reflections and your journaling, all of which will be described while “in the field.”**

See: <http://www.amazon.com/Future-Life-Edward-Wilson/dp/0679450785>