

Resource & Environmental Economics Field Examination

July 2004

Instructions:

- You have 4 hours to complete the exam. This time commences at the end of the 15-minute reading period during which no writing is allowed.
- Please use your assigned "alpha letter" on every page to identify your exam and number each page. Do not use your name or social security number. Write on only one side of the page leaving at least one inch margins. Upon turning in the exam make sure the pages are in order.
- You have four questions to answer with a choice of omitting any one of the five questions.

Answer four of the five questions.

1. There are indications that increasing greenhouse gas (GHG) atmospheric concentrations could produce significant future climate changes. Develop an economic framework for addressing GHG buildup and discuss economic aspects of the following questions:
 - a. What is the rationale for government and/or multi-government intervention in this situation?
 - b. Can the appropriate level of GHG buildup be addressed through markets? If so, how would you structure them?
 - c. Should the solution only include participation from those regions or countries currently creating the most GHG's?

2. Suppose that a country has a reserve of oil that, for the time, it has chosen to not use. The reasons for this might be presented in terms of political consequences or environmental costs, but an economist could summarize it as follows: given current prices, the costs are greater than the benefits. The reserve is big enough to be politically important in the country, and small, but not insignificant, relative to the global supply. However, political pressure is building to allow use of the reserve.
 - a. Utilizing a simple model and assuming fully efficient markets, evaluate whether the opening of the reserve would lead to a reduction in prices.
 - b. Discuss two assumptions of the simple model used in part a that you would want to relax if you were actually carrying out an empirical study of this problem?

3. In parts of Africa, Elephants are at risk of extinction. There are a wide range of economic issues at play. Elephants are at risk primarily because they are killed for their valuable ivory. They also are a local concern to farmers whose crops are frequently trampled on by the elephants. The concern for the elephants is global. Many tourists travel thousands of miles to view elephants in their natural habitat and millions of others simply demonstrate empathy for the elephants' fate.

Suppose you were asked to carry out an economic study of the value of a project to protect the elephant population.

- What empirical methods would you use in the study.
- Is there a potential conflict between economic efficiency conflict and concerns for equity and,
- If so, how would you suggest resolving that conflict?

4. Any policy to address climate change, including no action, will have current direct effects that are relatively well understood, and highly uncertain consequences that extend far into the future.
 - How should one analyze the tradeoffs that arise in this context?
 - What positive and normative issues need to be confronted?
 - What tools should be applied and why?

5. A water management authority has been instructed to begin considering river water's "opportunity costs" in all of the authority's allocation, regulatory, and policy decisions.

This is a new mandate for the authority, and its leaders have no experience that would allow them to comprehend

- (i) How the concept of opportunity costs might apply to river water,
- (ii) How the concept might impact any of their allocation, regulatory, or policy actions, or
- (iii) How to measure opportunity costs for the recreational use of instream water as well as for their urban and agricultural water supply system.

Please provide a discussion that assists the leadership by instructing them on these matters.

In preparing your discussion

- Be aware that this audience possesses good technical skills in mathematics and computer science, but they lack economic training.
- Focus your instruction on both the theory and empirical elements required for (i)-(iii).
- Be sure to link your theory and empirical recommendations.
- In your empirical recommendations, be very explicit about possible procedures for acquiring demand specifications for each of the three sectors.
- Offer specific technically oriented guidance wherever possible.