RESOURCES ECONOMICS PRELIMINARY EXAMINATION

June 14, 1978

This examination is for a four hour period, 8:00 to 12:00. Pace yourself in responding to questions considering this four hour restriction; i.e., do not spend an undue amount of time on any specific question at the expense of other questions.

1. "Optimum city (or community) size" is commonly defined as the low point of the per capita community expenditure curve, with population used as a proxy for output. How does this definition of optimum size differ from the concept of "optimum firm size"? To what extent is the former treatment of optimum size theoretically justified?

2. Suppose the Corps of Engineers proposes a construction project in an economically depressed rural area and asks you to make a benefit-cost study of the project. How will you measure the social opportunity cost of federal expenditures on the project? How will you measure the social opportunity cost of local workers who are presently unemployed,but will compete for jobs on the project?

3. California recently passed Proposition 13 which in effect reduced property tax by approximately 50 percent and put a maximum on annual possible increases in property tax. Comment on the distributional and allocative impacts of the Proposition for California and its citizens.

4. Water resource agencies in Texas indicate in their statistics that the state is using 5 million acre feet more water each year than is available on a renewable annual basis. Most of the deficit water use is in West Texas. However, East and South Texas have use rates very near the quantity of water available annually. Given annual consumption rates of water are increasing, assume the state has employed you to help them analyze the above situation. Specifically, the state needs projections of what can be expected over the next 50 years. Indicate how you would evaluate this situation, applicable theory and lastly from your knowledge of economics indicate adjustments that could be expected.

5. Suppose that production of a good, Q, results in external costs. Assuming an external cost function and demand and supply curves for Q, graphically answer the following questions.

   a) What is the socially desired level of production and consumption?

b) To internalize the externality we should tax or subsidize (circle one) producers at a rate equal to_____.

c) Considering consumers, producers, the government and third parties, what is the net gain to society of this tax or subsidy?

d) What equity and efficiency differences would there be between the policy you gave in b) above, and redefining property rights so that producers pay the full social costs of production? Be precise in your answer and give the effects in terms of areas on a graph.

e) State the critical assumptions that must be satisfied for your answers to be exact as opposed to approximations.

6. Assume you are an economist with a lumber company. It is your responsibility to advise the company on the optimal time of harvesting trees and reseeding. Develop a conceptional framework for optimizing profit for this lumber company.