

EEP101 Review

What you should know:

Basic concepts from micro-economics: Pareto-efficiency, Kaldor-Hicks criterion, definition of externalities and public goods.

Show **production and consumption externalities** in a graph and compare private and social optima under different market structures: indicate the social cost of an externality. Solve a numerical example and find the production quantities at the private and social optima.

Show how to move from the unregulated outcome to social optimum by using different **policy instruments**: a **pollution tax** on production, a **consumption tax**, an output-reduction **subsidy**, a **non-tradable standard** (quota), or **tradable quotas**. Show the change in consumer surplus, producer surplus and government revenue. Discuss the political economy of standards (non-tradable quotas): does the allocation method of permits matter for a) efficiency, b) distributional impact? Under what conditions does it matter, under what conditions doesn't it?

Be able to discuss the effects of the elasticity of the demand curve on **the welfare cost of externalities**.

“The **monopolist** is the environmentalist's best friend.” Discuss.

Show a **positive externality** in a graph.

Explain why **heterogeneity in pollution abatement costs** makes uniform non-tradable standards inefficient. Show the **gains from pollution trading** in a simple graph with two or three polluters.

What are the policy implications from an externality when pollution results from input use or directly from output?

Define the difference between **efficient pollution** levels and **cost-effective abatement**.

Solve for a **second-best tax** when the regulator aims at obtaining a fixed pollution level.

Explain the performance of **quantity-based instruments and price-based instruments under uncertainty** on the marginal abatement cost curve. When should the regulator prefer one to another?

Externalities from waste: show the optimal level of recycling in a diagram and discuss different solutions using the instruments discussed in class: **taxes, subsidies, standards, or deposit-refund systems**.

The Coase Theorem : explain. Being able to discuss when it might apply (what are the assumptions of the Coase Theorem?) Solve numerical example.

EEP101 Review

What you should know:

Define **liability rules and negligence rules**. When would the regulator prefer those regimes to property rights allocation?

What determines the **optimal restoration** levels on contaminated land?

Definition of **point and non-point source pollution**. Give an example of each.

Monitoring and compliance: what is an expected fine?

Air pollution policy:

What's a **non-attainment area**? Define the main components in the **EPA's emissions trading program (bubbles, netting, offset, banking)**. What are **hotspots**? What policy implications follow from pollutants being **uniformly mixed** or **non-uniformly mixed**?

Discuss a policy problem with respect to **criteria for policy instrument choice** (like on Problem Set 3 on the "Clear Skies" Initiative).

Mobile source air pollution:

Define **congestion externalities** in a graph. Show the net welfare loss to society from congestion and why the private and social marginal cost curves differ.

What's the difference in the impact of a vehicle license fee and a gasoline tax? Is it possible to implement a first-best policy for transport air emissions? (Hint: refer to the definition of non-point source pollution above.) What might a second-best policy look like? What is the effect of **fuel efficiency standards**? Define the rebound effect.

Technology adoption:

What is a **precision technology**? What is the difference between applied and effective input? Solve a two-step optimization problem of technology adoption (1) choose the optimal input level, 2) choose the technology with the highest net benefits, or lowest net cost.)

Assume the modern technology has a higher input use efficiency (a precision technology): will output be higher with the modern technology? Compare effective and applied input levels under the old and the modern technology.

Discuss the general formula for technology adoption. When is adoption more likely?

Calculate applied and effective input when there is a pollution tax, and discuss the effect of a pollution tax when $a_1 - a_0 < 0$.

Public goods:

Definition. Give examples or discuss whether certain goods are pure public goods or not (a bridge, a park, a beautiful view, biodiversity).

EEP101 Review

What you should know:

Define the socially optimal level of provision of a public good and compare it with a private market outcome (you may assume identical individuals). Discuss collective action and the free-riding problem. Explain the distinction between open access resources and common property regimes. Can there be private provision of public goods?

Compare the socially optimal level of an excludable public good and the provision level by a price-discriminating monopolist.

Calculate entrance fees, total revenue and costs under three different management regimes of an excludable public good (benevolent government agency, a private concessionaire, and a price-discriminating monopolist) when given a numerical example. Compare consumer and producer surplus and show in graphs aggregate demand curves, the optimal level of provision and the surplus to consumers.

Heterogeneous consumers:

In an efficient solution, should different people pay different prices for the public good? Under what condition is this feasible? Discuss which type of individual or household will consume an excludable public good when facing the different fees calculated above. Is it inefficient to exclude some households from consumption of the public good?

Valuation of environmental benefits:

Why do we measure the economic value of resources and the environment?

Explain the components of total economic value and discuss passive non-use values as a public good.

Explain the difference between the value measures WTA and WTP for either an improvement or a degradation in environmental quality. What are some explanations for why WTA could exceed WTP?

What is the difference between revealed preference techniques and stated preference techniques of valuation? Name two stated preference techniques and two revealed preference techniques.

Describe briefly the basis of the travel cost method, the hedonic pricing method, and the contingent valuation method. What are some potential biases of the CVM?

Which valuation method is best suited to capture existence value?

Water allocation and quality policies:

How do riparian rights and prior appropriation water rights allocate water resources?

Explain why a queuing system for water allocation is inefficient in allocating water between two sectors: agriculture and urban.

Starting from a queuing system, what are two alternative reform paths to efficient water allocation? Explain the distributional impact on the agricultural and urban sectors.

Can water trading in California improve the environment? (Think of in-stream benefits)

Discuss. Be able to solve a water allocation problem under queuing (amount of applied and effective water, output, producer surplus) and compare it to a market solution. Do senior rights holders gain or lose from water trading? What about junior rights holders?

What are the major water quality problems resulting from irrigated agriculture?

EEP101 Review

What you should know:

Biotechnology:

Are the environmental effects of biotechnology in agriculture that bad? (Examples: bt cotton, golden rice) Discuss.

The economics of pesticide use:

What is the economic threshold for pesticide use?

What is the difference between preventive application and reactive application of pesticides? Why do not all farmers adopt IPM?

How do risk assessment models help in the design of policy to reduce the health risks from pesticides?

What are the effects of a pesticide ban (on producers, farm workers, consumers, and the environment)? Draw a supply and demand curve diagram to explain the changes in consumer and producer surplus. What are the effects of using alternative policies, like a pesticide taxes, tradable quotas, or differentiated re-entry regulations? When are they feasible?

Global pollutants and international environmental agreements (IEAs):

What mechanisms can be used to overcome the prisoners' dilemma of contributing to the public good of abatement of a global pollutant?

Discuss different means of obtaining a fair burden-sharing between industrialized and developing nations.

What is the role of a minimum participation clause in an IEA?

What is carbon leakage? What can be done to limit carbon leakage?

What can be done to reduce the compliance costs of adhering to a quantified emission reduction objective under an international treaty on global climate change? (Take the Kyoto Protocol as an example.)

Environment and development:

Are economic growth and environmental quality compatible? What is an environmental Kuznets curve? What role does "scale" (absolute GDP level) play for environmental quality? Is small always beautiful?

Give one definition of sustainable development (SD). What is the main difference between the weak and strong definitions of sustainability?

Is an efficient economic allocation always sustainable? Is a sustainable consumption path always efficient?

Can we measure welfare by the net national product measure (NNP)?

What role does irreversibility play in environmental policymaking?

What does the Polluter Pays Principle imply for environmental policy?

What does the Precautionary Principle imply for environmental policy?

Environmental justice:

What criteria are there for assessing distributive justice: compare egalitarianism, utilitarianism, and the Rawlsian maximin principle.

EEP101 Review

What you should know:

How does policy and the market deal with the NIMBY syndrome for locating hazardous waste facilities?

What is the incidence of pollution control policies?

Could the delocalization of polluting industry to developing countries be economically efficient? Is it equitable? Is it consistent with a sustainability criterion?

New York State exports hazardous waste to South Carolina – should this kind of trade be banned? What if the U.S. exports waste to Mexico– should this kind of trade be banned?

Brazil exports waste to the UK – should this trade be banned? Discuss different arguments.