

# Public Goods and Common Property Resources

## Lecture 3

### 1. Public Goods

- Shared by all owned by no one
- Examples of Public Goods
  - National defense, Biodiversity, Lighthouse (classic)
- Examples private goods
  - Candy bar, movie, clothes, cars, etc.

- Characteristics used to define public, private and other goods

- Rivalry
- Excludability

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**Rivalry** – extent to which one individual's consumption diminishes amount available for others

**Exclusion** – extent to which an individual can be excluded from consuming a good

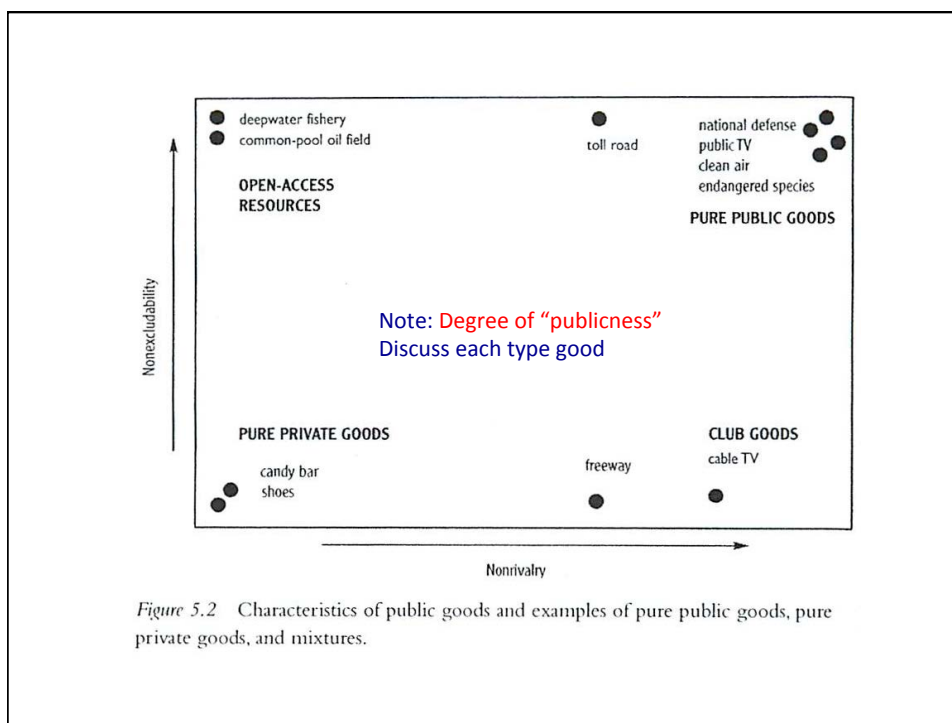
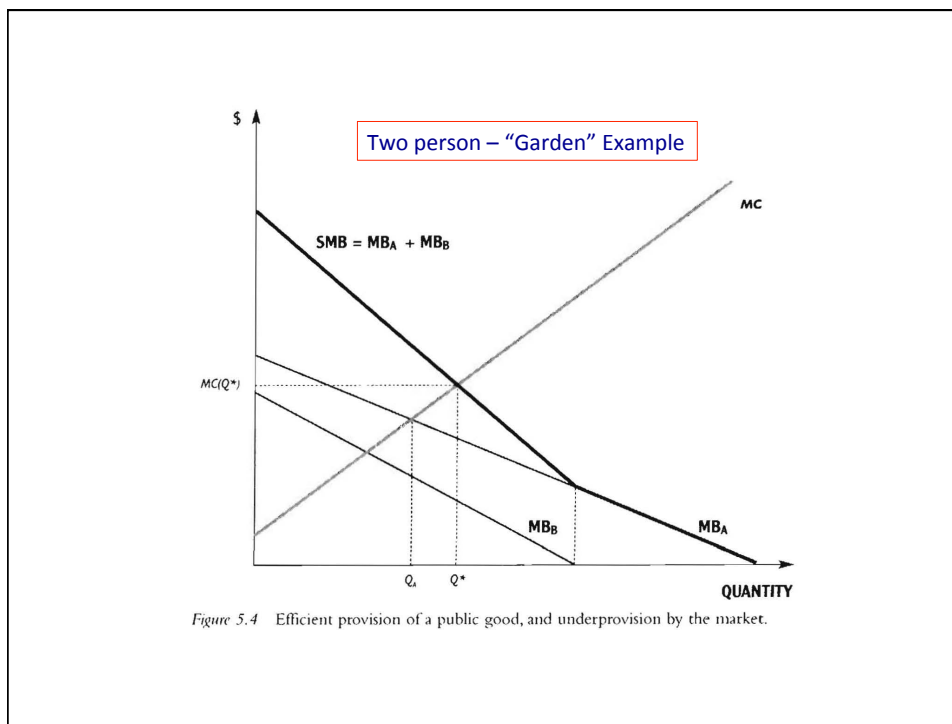


Figure 5.2 Characteristics of public goods and examples of pure public goods, pure private goods, and mixtures.

- Comments
  - Excludability depends on technology, costs, institutions, and may change over time
    - Examples: range land, lighthouse, toll road vs. open highway
  - Congestion and club good
    - Non-rivalry for low levels of consumption, rivalry at high levels
    - Highway, swimming pool

- How markets fail to provide efficient levels of public goods
  - Consider individual demands for public good (See next page)
  - Demands “sum vertically”
  - Efficient allocation is  $Q^*$
  - Market allocates  $Q_A$
  - Market Failure



- Optimal provision of public goods
  - Samuelson conditions for optimal provision
  - Same as graph over many n (people)

$$mc = \sum_{n=1}^N mb_n$$

- Comments
  - Free riding
    - Examples: garden, NPR,
  - Some private provision occurs
    - Point A in graph
  - Contrast to private good
  - Small numbers and cooperation
  - “Collective Action” problem
  - Public Good → Positive public externality
    - Something external not captured in markets

## 2. Common Property Resources

- Tragedy of the Commons (Garrett Hardin)
- Examples/Stories
  - Hardin discussed “commons” in England
  - Refrigerator in Basement of Robinson Hall
  - Deep sea fishery
  - Underground aquifers
- Open-Access resources (non-excludable, rival)

- Like public good
  - Private incentives are “faulty”
  - Market Failure
  - Collective Action problem
- Examples again
  - Fishers cooperating (open sea fishery)
  - Students cooperating (refrigerator)
  - Households/Firms cooperating (aquifer)

- Common Property Resource as a **Prisoner’s Dilemma**
  - If everyone cooperates you get best outcome for everyone but individual incentives are to not to cooperate
  - Note: Wikipedia entry on Prisoner’s Dilemma is good. Check it out.
  - Note: An interesting Prisoner’s Dilemma:  
<http://thoughtshoppe.blogspot.com/2011/11/traffic-jam-and-prisoners-dilemma.html>

	A DEFECT	A COOPERATE
B DEFECT		
B COOP-ERATE		

Dominant strategy is to rat out colleague. Defect. Nash Equilibrium.

- Comments
  - Small numbers, homogeneity, and cooperation (Elinor Ostrom)
  - Social norms & mores as solution
  - Collective action problem
  - Common Property Resource → “Common Property” externality
    - Something external not captured in markets

- Conclusions
  - Externalities, Public Goods, and CPR are not distinct problems, but rather different ways of framing the same underlying market failure
  
  - Keys:
    - Lack of property rights
    - Non-excludability

- Morally neutral explanation for environmental problems
  - Not “bad people” but people ....
  
  - Problem is unregulated market fails to align self-interest with broader effects on society
  
  - Incentive problem – need to get incentive right
  
  - Solutions – provide right price signals, assign property rights, create market for goods