공공재와 공유자원

11. Public Goods and Common Resources

Seoul National University

공공재는 아무도 안하려고 하기 때문에 정부가 강제로 사줘야함.
공유자원은 모두가 필요이상으로 하려하기 때문에 정부가 막아야함.

Introduction

- We now addresses public goods and common resources
  - goods for which it is difficult to charge prices to users
  - often free to the consumer
- market forces that normally allocate resources are absent.
  - Free goods, such as playgrounds and public parks, may not be produced and consumed in the proper amounts.
- Government can potentially remedy this market failure and improve economic well-being.
- One of the Ten Principles from Chapter 1:
  - Governments can sometimes improve market outcomes.

The Different Kinds of Goods

구분		경합성 있음	경합성 없음
배재성	있음	사적재 ex) 아이스크림 유료도로	집단재 ex) 영화 유선방송
	없음	공유재 ex) 공유지, 바닷속 물고기	공공재 ex) 공원, 가로등

- Excludability
  - the property of a good whereby a person can be prevented from using it.
- Rivalry in consumption
  - the property of a good whereby one person's use diminishes other people's use.

소비를 하는데 라이벌이 있나? (경합성, 비경합성)

내가 아이스크림을 먹으면
딴 사람이 못 먹는다.

나만 할 수 있는거!
남들은 SNU WIFI를 못쓴다!

지금까지 배운거

Excludable? (배제성) \ Rival in consumption?	Yes	No
Yes	Private Goods • Ice-cream cones • Clothing • Congested toll roads	Club Goods • Fire protection • Cable TV • Uncongested toll roads
No	Common Resources • Fish in the ocean • The environment • Congested nontoll roads	Public Goods (가로등) • Tornado siren • National defense • Uncongested nontoll roads

공공자원 공공재

- No clear separation in some cases

Public goods and common resources

- Not excludable
  - People cannot be prevented from using them
    - Available to everyone free of charge
    - No price attached to it
- External effects
  - Positive externalities (public goods)
  - Negative externalities (common resources)
- Private decisions about consumption and production
  - Can lead to an inefficient allocation of resources
- Government intervention
  - Can potentially raise economic well-being

Public Goods 공공재

가로등을 만들면 돈 안낸사람을 제제할 방법이 없다. 아무도 돈을 안내려한다(무임승차)

배제가 안되어서 무임승차 문제. 정부가 나서서 해결을 해야한다.

- Free rider
  - Person who receives the benefit of a good but avoids paying for it
- The free-rider problem
  - Public goods are not excludable
  - People have incentive to be free riders
  - Prevents the private market from supplying the goods
- Our textbook example: fireworks on 7/4

Public Goods - example

- 500 residents in a small town
  - Each places \$10 value $\rightarrow$ total value = \$5,000
- Total cost = \$1,000
- Efficient to have a fireworks display on the Fourth of July
- Would the private market produce the efficient outcome?

Public Goods

- Government can remedy the free-rider problem
  - If total benefits of a public good exceeds its costs ($5,000 > $1,000)
  - Provide the public good (or hire someone to do it)
  - Pay for it with tax revenue (ex. $2 tax per person)
  - Make everyone better off ($10 > $2)
- Problem: Measuring the benefit is usually difficult.
- Cost-benefit analysis: a study that compares the costs and benefits of providing a public good
- Cost-benefit analyses are imprecise, so the efficient provision of public goods is more difficult than that of private goods where prices serve as a signal.

Some Important Public Goods

- National defense
- Basic research
  - General knowledge
  - Subsidized by government
  - The public sector fails to pay for the right amount and the right kinds
- Antipoverty programs
  - Some would free ride on the generosity of others
  - Private charity is not sufficient

Are lighthouses public goods?

- Some goods can be either public of private goods – depending on the circumstances.
- Fireworks
  - Public good in a town with many residents
  - Private good at a private amusement park

일반 불꽃놀이와
에버렌드의 불꽃놀이는 다르다!

- Lighthouses
  - Usually not excludable & not rival in consumption
  - Most are operated by the government

Are lighthouses public goods?

- In some cases, lighthouses are closer to private goods.
  - Coast of England, 19th century
  - Lighthouses were privately owned and operated
  - The owner of the lighthouse charged the owner of the nearby port
  - If the port owner did not pay, lighthouse owner turned the light off
    - Ships avoided that port
- Decide whether something is a public good
  - Determine who the beneficiaries are
  - Determine whether the beneficiaries can be excluded from using the good
- A free-rider problem
  - When the number of beneficiaries is large
  - Exclusion of any one of them is impossible

The difficult job of cost–benefit analysis

How much is a life worth?

- Cost: $10,000 for a new traffic light at a intersection
- Benefit: increased safety
  - Risk of a fatal traffic accident
    - Drops from 1.6% to 1.1 %
- Obstacle
  - Measure costs and benefits in the same units
- Put a dollar value on a human life? 사람목숨의 비용은 얼마인가..??
  - Priceless = infinite dollar value (∞)
- In this case, should build traffic light
  - not only at the intersection
  - but also on every street corner

The difficult job of cost–benefit analysis

How much is a life worth?

- In the real world, we are at times willing to risk our lives to save some money and for other purposes
- People may value their lives differently. But, on average, it appears that we do not behave as if life is priceless.
- Implicit dollar value of a human life
  - Courts: award damages in wrongful-death suits
    - Total amount of money a person would have earned if he or she had lived
    - Ignores other opportunity costs of losing one's life
  - Risks that people are voluntarily willing to take and how much they must be paid for taking them
    - Value of human life = $10 million

100억! 살아있었더라면 버는 비용으로 계산

The difficult job of cost–benefit analysis

How much is a life worth?

- Cost-benefit analysis
- Traffic light
  - Reduces risk of fatality by 0.5 percentage points
- Expected benefit = 0.005 $\times$ \$10 million = \$50,000
- Cost (\$10,000) $<$ Benefit (\$50,000)
- Approve the traffic light

Common Resources 공유자원

- Like public goods, common resources are not excludable.
  - Cannot prevent free riders from using
  - Little incentive for firms to provide
- Additional problem with common resources: rival in consumption
  - Each person's use reduces others' ability to use
  - Role for govt: ensuring they are not overused

The Tragedy of the Commons 공유지의 비극

양을 막 풀면, 풀이 없어져서 다 죽는다.
물고기를 막 잡으면, 물고기의 씨가 마른다.

- A parable that illustrates why common resources get used more than is socially desirable.
- Setting: a medieval town where sheep graze on common land.
- As the population grows, the # of sheep grows.
- The amount of land is fixed, the grass begins to disappear from overgrazing.
- The private incentives (using the land for free) **outweigh** the social incentives (using it carefully).
- Result: People can no longer raise sheep.

The Tragedy of the Commons

- The tragedy is due to an externality:
  - Allowing one's flock to graze on the common land reduces its quality for other families.
- People neglect this external cost, resulting in overuse of the land.
- Government can solve the problem
  - Regulation or taxes or permits in order to reduce consumption of the common resource
  - Turn the common resource into a private good
    - the enclosure movement in England, 17th century.

Some important common resources

- Clean air and water
  - Negative externality: pollution
  - Regulations or corrective taxes
- Congested roads
  - Negative externality: congestion
  - Corrective tax: charge drivers a tool
  - Tax on gasoline (a complementary good to driving)

Some important common resources

- Fish, whales, and other wildlife
  - Oceans are the least regulated common resource
    - Needs international cooperation
    - Difficult to enforce an agreement
  - Fishing and hunting licenses
  - Limits on fishing and hunting seasons
  - Limits on size of fish
  - Limits on quantity of animals killed

Case study

- Animals with commercial value that are threatened with extinction
- Buffalo
  - North America
  - Hunting in 19th century (60 million $\rightarrow$ 400)
- Elephants
  - African countries
  - Hunting today

Case study

- The cow
  - Commercial value
  - Species continues to thrive
- Cows are a private good
  - Ranches are privately owned
  - Rancher - great effort to maintain the cattle population on his ranch
    - Reaps the benefit

Case study

아프리카의 코끼리 상아 이야기.
코끼리의 사유화? 정도

- Elephant - common resource
  - Poachers are numerous; Strong incentive to kill elephants
- Government of Kenya, Tanzania, and Uganda
  - Illegal to kill elephants and sell ivory
  - Hard to enforce laws
  - Decreasing population of elephants
- Government of Botswana, Malawi, Namibia, and Zimbabwe
  - Made elephants a private good
  - People can kill elephants on their own property
  - Landowners have an incentive to preserve the species
  - Elephant populations have started to rise

CONCLUSION

- Public goods tend to be under-provided, while common resources tend to be over-consumed.
- These problems arise because property rights are not well-established:
  - Nobody owns the air, so no one can charge polluters.
    - Result: too much pollution.
  - Nobody can charge people who benefit from national defense.
    - Result: too little defense.
- The govt can potentially solve these problems with appropriate policies.