

# MARKET FAILURE

- **EXTERNALITIES-**
- **Marshall – only external economies-benefits**
- **Pigou- externalities-+VE &-VE**
- **K.W .Knapp- Social cost of Private enterprise**

# EXTERNALITIES TYPES

- *Positive Consumption Externalities*  
(vaccination)
- *Positive Production Externalities*  
(pollination- beehives)
- *Negative Consumption Externalities*(noise/loud music)
- *Negative Production Externalities*(emissions/pollution)

# EXTERNALITIES TYPES

- **Technological – Alter production functions**
- **Pecuniary- affect market prices- no distortion in efficient resource allocation**
- **Most Env. Problems are related to Negative externalities**
- **Discharge of effluents in a river- organic & inorganic material- reduce water quality – reduce DO- kills fish / undrinkable**

# EXTERNALITIES

- There is incentive to pollute- cheaper to pollute than to treat effluents
- Externality cause market failures
- Why- firms do not consider exact prices & costs in decision making.
- Assimilative capacity – unpriced env.good
- $P \neq MC$
- P & Q levels in efficient socially

# EXTERNALITIES

Relevant cost for decision making

$$MSC = MPC + MEC$$

If no externality market is efficient &

$$P = MPC$$

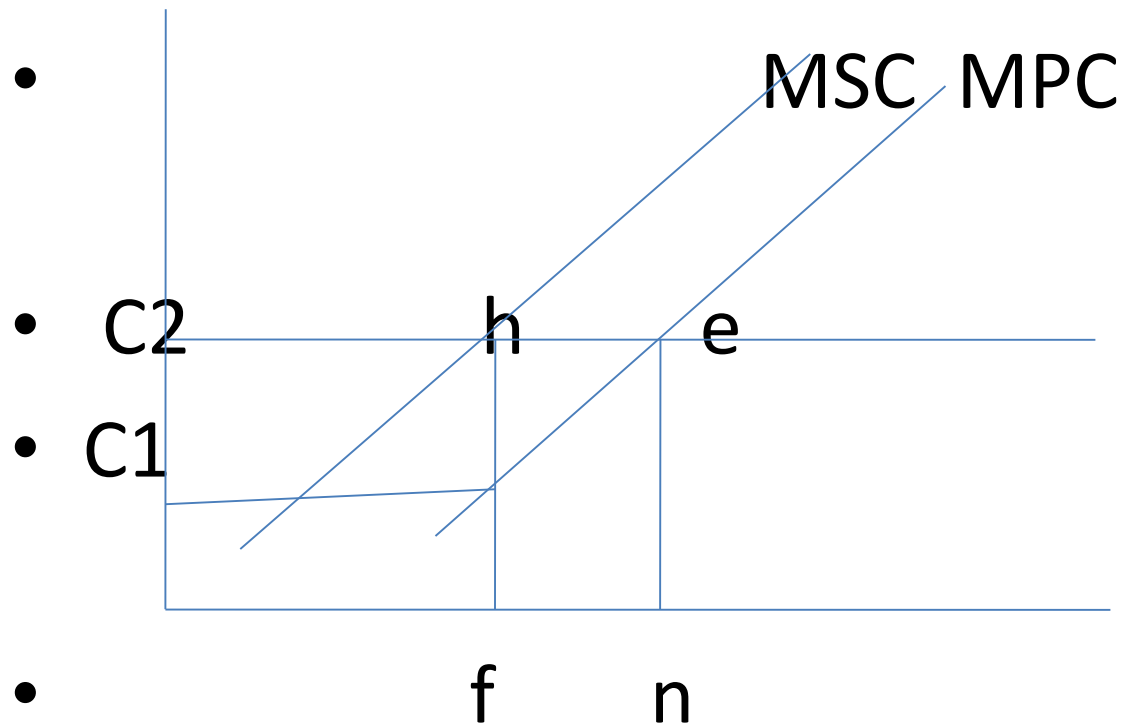
When externality , efficiency when

$$P = MSC$$

MEC – effect upon third parties

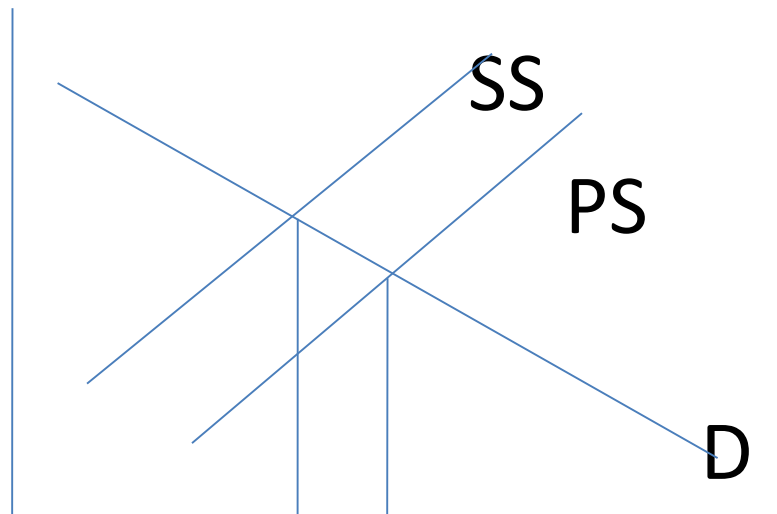
# EXTERNALITIES

- Price



# EXTERNALITIES

- Price not include external cost --- excess production--- resource to be used elsewhere
- Horizontal summation of MPC—PS
- Summation of MSC and MPC --- SS



# EXTERNALITIES

- Private mkt more output & too low price
- If external costs internalised –output decline to socially optimum.



# POSITIVE EXTERNALITIES

- Positive externalities are also called external economies
- Positive externalities exist when production or consumption activity of a person affects another person favourably and without any price payment
- When you plant trees in your land- neighbors get benefit in the form of high air quality and cool atmosphere
- You cant charge the neighbor for it

# POSITIVE EXTERNALITIES

- Here also market failures occur- you do not get the full price/ benefit of your planting trees
- So that your planting of trees will be less than the social optimum
- Optimum when  $MC = MPB + MEB = MSB$
- Give subsidy equal to the amount of ext. benefit

# POSITIVE EXTERNALITIES

- P

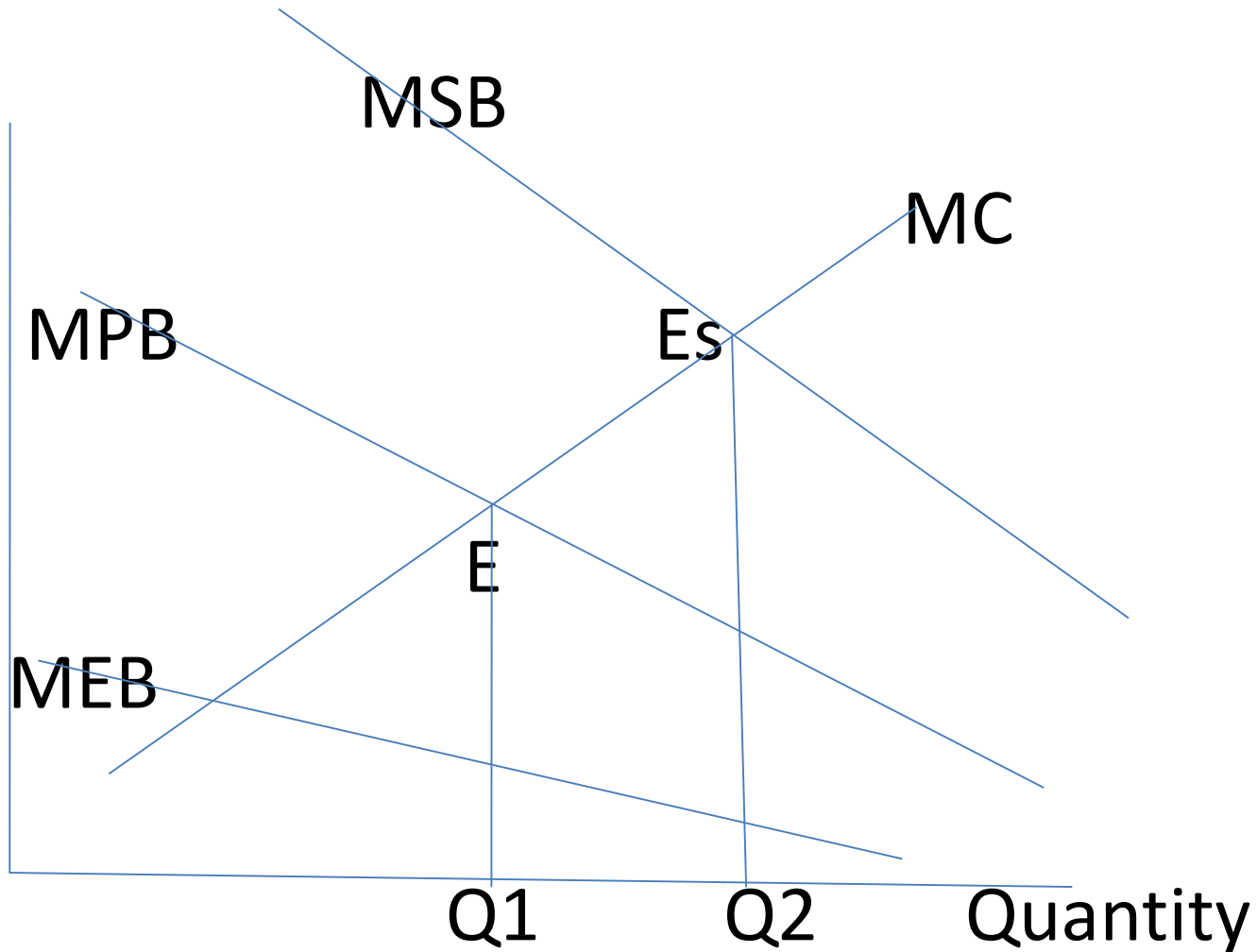
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# SOLUTIONS FOR EXTERNALITIES

- 1. prohibit activities causing envt. Damage
- 2. solution by direct control- setting a ceiling to the quantity of effluents
- 3. Impose penalty tax in cases external cost & give subsidy in cases of ext. benefit
- 4. giving pollution permit – marketable licenses- give right to pollute
- 5. solution by non mandatory investment- voluntary installation of pollution control devices

# SOLUTIONS FOR EXTERNALITIES

- 6. direct action by govt.- invest in sewage plants
- 7. property rights – restoration of pvt ownership

# NON EXCLUSION & COMMONS

- A case of market failing to allocate resources efficiently when it is impossible or costly to deny access to an env. Asset
- If your consumption rivals mine both have incentive to capture max. benefits
- Leads to overuse relative to what is best for society
- Market fails to signal the true scarcity of the asset

# NON EXCLUSION & COMMONS

- Leads to Over exploitation & Hardin's article "tragedy of commons" (1968)
- Commons are envt. Assets/ common pool resources/ CPRs/ open access resources
- 1. fishing grounds- more catch by one = less by others—incentive to increase fishing effort beyond optimal level ie  $P = MC$
- Go up to the level where  $P = AC$

# NON EXCLUSION & COMMONS

- Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit - in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own interest in a society that believes in the freedom of the commons. (Garret Hardin, 1968)



# NON EXCLUSION & COMMONS

- Over exploitation of fisheries
- 1992 Canada declared moratorium on fishing on Grand Banks in North Atlantic—cod & flounder became endangered- 30000 fishermen lost job in Newfoundland
- 2 black sea- common resource of – 6 nations- Bulgaria, Georgia, Romania, Russia turkey Ukraine
- Receptacle of drainage of 16 more countries- no exclusion – severe damage of coastal eco system

# NON RIVALRY –PUBLIC GOODS

- An env. Asset is a pure public good if its consumption is non rival & non excludable
- A public good is available to all – its consumption by one will not reduce its availability to another
- $MC = 0$

As non excludable – mkt cant function- free rider problem = enjoys a facility without paying for it

# NON RIVALRY –PUBLIC GOODS

- Tropical rain forest provides public goods to the local economy- controls water flow, checks soil erosion & nutrient recycling
- Also to global economy- preserve bio diversity, carbon sink-
- Wetlands also do.- buffers the economy from natural & manmade shocks controls precipitation, water purification ,habitat services etc- no voluntary action to preserve it

# ASYMMETRIC INFORMATION

- ***MARKET FAILURE*** when one party to a transaction does not have full information about either the actions or hidden characteristic of the other party
- Two problems-
- 1. adverse selection
- 2. moral hazard

# ASYMMETRIC INFORMATION

- *MORAL HAZARD*
- Creates two related problems of env. Assets
- 1. when regulator cannot monitor actions- shirk on pollution abatement.
- He bears all costs but get only a share of benefits.
- Individual pays cost of pollution abatement but get only part of benefits to the society- incentive to reduce pollution control

# ASYMMETRIC INFORMATION

- 2. when private market cannot monitor actions – insurer withdraw from pollution liability market.
- Industries take insurance against accidental spills/ storage of pollution.
- Insurance company is not aware of precaution by insuree

# ASYMMETRIC INFORMATION

- **ADVERSE SELECTION**
- **Eco friendly products & practices- more expensive due to lack of scale economies**
- **If buyer cannot distinguish from eco products from products from std practices- no incentive to pay extra- eco products driven out of markets**

# **INTEGRATED ENV. & ECONO. ACCOUNTING : GREEN A/Cing**

- **Green accounting- a system of sustainable accounting**
- **A measure of sustainable national income**
- **Green accounting is computation of NI of a nation by taking into account the economic damage and depletion in the natural resource base of an economy.**
- **Measures sustainable income level that can be secured without decreasing stock of natural resources**



# INTEGRATED ENV. & ECONO. ACCOUNTING : GREEN A/Cing

- Traditional NI a/cs is called SNA- UN Statistical Office
- NI- *money value of all final goods & services produced in a country during a year*
- Adjustment in SNA in terms of changes in natural resources
- In SNA allowance made for depletion of man made capital in calculating NDP
- $NDP = GDP - \text{Depreciation}$

# INTEGRATED ENV. & ECONO. ACCOUNTING : GREEN A/Cing

- SNA Defects
- 1. measures nation's wealth in terms of man made capital only, ignores natural capital like forests fishing stock etc.  
Also ignores depletion of natural capital like farm land, minerals etc.

# INTEGRATED ENV. & ECONO. ACCOUNTING : GREEN A/Cing

- 2. env. Degradation from pollution- ignored
- 3. cost of environmental protection- exp to restore env. Assets (pollution control equipment, medical exp due to env. Related illness) are included in the NI. No allowance for corresponding env. Damage- defensive expenditures

# **INTEGRATED ENV. & ECONO. ACCOUNTING : GREEN A/Cing**

- **Defensive exp. Are included as income**
- **Alaskan oil spill of 1989- most serious env. Accident in USA recorded a rise in GNP. Clean up operations exp. \$2billion added to income**

# **INTEGRATED ENV. & ECONO. ACCOUNTING : GREEN A/Cing**

- **Sustainable income – originated by sir John Hicks environmentalists argue for 3 kinds of adjustments for NI**
- **1. adjustments for depletion of natural capital**
- **2. for env. Degradation**
- **3. for defensive expenditures**

# GREEN ACCOUNTING

- Statistical division of UN developed a System of Environmental & Economic Accounting (SEEA)
- SEEA focus on
  - 1. accounting for depletion of scarce natural resources
  - 2. measuring the cost of env. Degradation & prevention

# GREEN ACCOUNTING

- In SNA , NDP is
- $NDP = \text{Net exports (X-M)} + \text{Final consumption (C)} + \text{Net Capital accumulation (I)}$
- To arrive Green NDP or EDP, net capital accumulation is replaced by net capital accumulation of produced and non produced economic assets minus net accumulation of non produced natural assets

# GREEN ACCOUNTING

- $EDP = (X-M) + C + Nap.ec + (Nanp.ec - Nanp.n)$
- EDP = Env. Domestic product
- $X-M$  = export net imports
- $C$  = capital consumption
- $Nap.ec$  = net accumulation of produced economic assets
- $Nanp.ec$  = net accumulation of non produced economic assets
- $Nanp.n$  = net accumulation of non produced nat. assets



# GREEN ACCOUNTING

- Produced eco. Assets-tangible assets + non tangible like exploration of minerals
- non produced economic assets- comes into existence in ways other than production- land, subsoil assets
- Also intangibles- patents, leases, contracts
- Nanp.n- records effects of economic activities on natural assets such as air, water, virgin forests

# ENVIRONMENTAL VALUATION

- Env. Valuation- estimating eco. Values of env. Assets, goods & services
- Helps in estimating env. Damages & useful in env. Decision making
- Used for purposes like formulation and appraisal of env. Conservation projects, preparing green a/cs etc
- It is the sum total of discounted present values flows of all g/s from a resource over its life span

# ENVIRONMENTAL VALUATION

- Total economic value of an asset consists of its use value and non use value
- $TEV = UV + NUV$
- Methods
- Appraisal of investment projects includes Environmental Impact Assessment

# METHODS OF ENV. VALUATION

- **1. MARKET VALUATION-** method used in conventional NI a/cs
- **Uses actual or imputed values of env. Goods, amenities, services etc.**
- **Justified by neoclassical approach- prices reflect values**
- **But prices for env. Goods not existing**

# METHODS OF ENV. VALUATION

- **2. PREVENTIVE EXP. METHOD-** cost based valuation method uses data on actual exp made to alleviate env. Damage.
- Cost is involved in mitigating env. Damages
- Value is calculated from how much people pay for preventing env. Damage-preventive exp type technique

# METHODS OF ENV. VALUATION

- 3. replacement cost technique
- Estimate exp people are willing to undertake to restore the env. To previous state after its degradation
- People instal devices to correct damage of air water land etc

# METHODS OF ENV. VALUATION

- **4 HEDONIC PRICE METHOD:**
- **Prices people pay for properties is having both Env. & non Env. Characteristics**
- **The implicit prices are sometimes referred as hedonic price**
- **Variation in property value b/w locations- env. character**

# **METHODS OF ENV. VALUATION**

- **5. TRAVEL COST METHOD**
- **Estimation is on the basis of time and cost people are willing to spend for travelling to areas with pleasant envt**
- **To calculate recreational or eco tourism values of a recreational site- hill station , national park**



# METHODS OF ENV. VALUATION

- 6. CONTINGENT VALUATION METHOD
- It is a survey method
- A subset of population is surveyed and asked to value envt. Two methods
- 1. willingness to pay for an env. Benefit
- 2. willingness to accept compensation for a loss of env. quality