Topic 2: Economic Approach

2.1 Economic efficiency and market allocations → 2.2 Sources of inefficent allocation of resources → 2.3 Ways to restore economic efficiency

2.1 Economic efficiency and market allocations

What do we mean by "**Economic Efficiency**"?

- **Static efficiency**: An allocation of resources is deemed to achieve static efficiency if that allocation maximizes economic surplus from those resources.
    - **Economic surplus** = the sum of consumers' surplus and producer's surplus.
        - Consumer surplus (CS): The value that consumers receive from an allocation minus the costs of obtaining it or the excess of total willingness to pay (demand curve) over the actual expenditure
        - Producer surplus (PS): The profit that producers receive from an allocation or the excess of prices they received over the marginal cost curve.

Graph - The Consumer's choice and CS	Graph - The Producer's choice and PS

- **Efficient market allocations** can be achieved in *a well-defined system of property rights* and with *competitive markets* for selling those rights that enable both producers and consumers to maximize their surplus. The market price induces self-interested parties to make choices that also turn out to be efficient from the whole society point of view (socially productive paths driven by self-interest). The seller has the right to get the payment from selling the products while consumers have the right to choose the amount to buy that maximize their surplus at a market price.

Graph – An Efficient market allocation

A system or structure of **well-defined property rights** are key to efficient market allocation.

- Property rights refer to a bundle of entitlements defining the owner's rights, privileges, and limitations for use of the resource. All resources are either privately or collectively owned.
- A ***well-designed property rights*** represents a set of entitlements that define the owners' privileges and obligations for use of resource or asset based on 3 main characteristics:
    - **Exclusivity:** all benefits and costs from use of a resource accrue to the owner (s), and only the owner (s), either directly or sale to others.
    - **Transferability:** property rights should be transferable from one owner to another in a voluntary exchange.
    - **Enforceability:** property rights should be secure from involuntary seizure or encroachment by others.
- Property rights with these characteristics enable an owner of a resource to have a powerful incentive to use that resource efficiently because a decline in the value of that resource result in his or her personal loss.

2.2 Sources of inefficient allocations of resources

a. Externalities as a source of market failure

A violation to exclusive property rights occurs when an agent (the owner of resource) who makes a decision does not bear all of the consequences of his or her actions, for example, their external costs and benefits occurred from his/her decisions. This violation could lead to environmental problems from externalities. Externalities or external effects can be positive (external benefit) or negative (external cost). An externality can arise

- whenever the welfare of some agent, either a firm or consumer, depends not only on his or her activities, but also on activities under the control of some other agent.
- when the market price or cost of production excludes its external social impact (costs or benefits)

Example: A steel market and its external costs (production wastes into the river)

b. Government failure

Market processes are not the only sources of inefficiency. Some environmental problems have arisen from a failure of political, rather than economic. Government failure could provide improper incentives as the root of the problem.

- **Rent seeking:** A rent seeking activity will typically increase the net benefits to the special interest groups, but it will frequently lower the benefits to society as a whole. Rent seeking uses political process in lobbying resources and other activities directed at changes in policies and regulations that result in more profitable outcomes for those special interest groups/funding the activity. Rent seeking can take many forms. For example, producers seeking protection from pressures brought by imports; consumer groups can seek special subsidies to transfer part of their costs to general taxpayers.
- **A side effect of social policy objectives in causing an environmental inefficiency:** For example, the subsidization to the production of steel rises pollutions from increased steel production.

Example: A steel market with government subsidy

c. Public goods

Public goods are a form of market failure. While a private good is excludable and rival in consumption, public goods are non-excludable and non-rival in consumption.

- **Non-excludability**: when a person cannot be excluded from its benefits and costs, even those who fail to pay for it cannot be excluded from enjoying the benefits it confers.
- **Non-rival consumption:** when one person's consumption of the good does not reduce its availability for others.

Several common environmental resources are public goods, including "beautiful landscape", clean air, clean water, climate change protection and biodiversity preservation.

Example: Efficient provisions of public goods

Why would a competitive market not be expected to supply the efficient level of the public good? Do people pay enough to create the social optimal level of the public goods? The potential problem with using the market to provide the public good voluntarily is:

Free rider: Inefficiency results because each person could become 'free rider' on the other's contribution. Since he or she cannot be excluded from the same amount of the good, each person has an incentive to let someone else provide the public goods. A free rider derives the value from a commodity without paying an efficient amount for its supply.

d. Asymmetric information

Market failure occurs when people cannot observe either the actions or types of other people. Asymmetric information creates problems for the market when it results in a decision maker knowing too little to make an efficient choice.

For example, a consumer had a preference for organic food (or sustainable production of products) and these products are more expensive. However, if a consumer does not know or cannot distinguish true organic food, he or she would tend to be unwilling to pay a higher price. The sellers with an above-average quality product who cannot get a price premium have no incentive to stay in the market. As a result, both profits and the output of true organic farmers would be inefficiently low. If consumers do not have full information, negative externalities may result.

2.3 Ways to restore economic efficiency

Looking back at economic efficiency definitions:

"Efficient market allocations can be achieved in *a well-defined system of property rights* and with *competitive markets* for selling those rights such that both producers and consumers can maximize their economic surplus (i.e., **static efficiency**)."

"Environmental problems can arise when property rights are ill defined, and when these rights are exchanged under something other than competitive conditions."

This section explores several ways to restore economic efficiency in allocations of resources through both private and public remedies

a. Private resolution through negotiation – the Coase Theorem

When the number of affected parties is small, the simplest ways to restore efficiency could be possible through negotiations and the court system.

- **Property rules**: Specify the initial allocation of the entitlement or property right (e.g., the right to add waste to the reiver, the right to an attractive river, etc.). The court merely decide which right based on whose right was violated. See example of the Coase Theorem below

Example: Efficient output with pollution damage

Following **the Coase theorem** (Ronald Coase, 1960), as long as negotiation costs are negligible and affected parties can negotiate freely, an efficient allocation would result from allocation of entitlement by the court to either party. The court's decision would only affect the distribution of surplus among the affected parties and an efficient allocation would result in either case. For example,

i. If the property right is assigned to the steel company, the cost is borne by the resort (damage cost + payment to reduce the level of damage)
ii. If the property right is assigned to the resort, the cost is borne by the steel company (must compensate for all damage costs)

The Coase Theorem relies on the assumptions that transaction costs (administrative costs such as court time, lawyer's fees, etc.) which may be rarely the case and there is no significant wealth effects (for example, when the property right is assigned to the polluter, some may have incentives to increase production and earn the payments)

- **Liability rules**: Award monetary damages to the injured party. For example, this rule would force the steel company to compensate the resorts for all damages. If the design of liability rules is appropriate, it can correct inefficiencies by forcing those who cause damage to bear the cost of the damage or internalizing externalities to profit-maximizing decisions.

b. Public resolution through policies and regulations

- **Putting a cap**: Restrict the production of steel or pollution to Q* backed up with sufficient punishment such as jail sentences or fines to deter potential violators.
- **Putting a price**: Impose a tax on steel or pollution. A per-unit tax = the difference between two marginal cost curves.
- **Establishing rules**: Establish rules to permit certain activities to reduce damage and provide greater flexibility. For example, the use of zoning laws to separate areas for steel plants and resorts.
- **Other regulations:** Implement labelling standards (notifying about product information) and reliable certification processes could reduce the asymmetric information problems for organic products (sustainable products), enabling consumers to distinguish premium quality.

Reference:

[TL] – Tietenberg, T. and Lewis, L. Environmental Natural Resource Economics, 2015 (10th edition), Pearson, Chapter 2.

[HSW] – Hanley, N., Shogren, J. and White, B., Introduction to Environmental Economics 2013 (2nd edition), Oxford University Press, Chapter 2.