



LESSON NOTES

Term 3:

Worksheet 17

Subject: Economics

Year / Level: 13

Name: _____

Strand	5 – Development Economics
Sub Strand	5.1 – Environmental Economics
Content Learning Outcome	5.1.1 - Explore the impacts of economic activities on natural environment and identify strategies for sustainable development.

ENVIRONMENTAL ECONOMICS

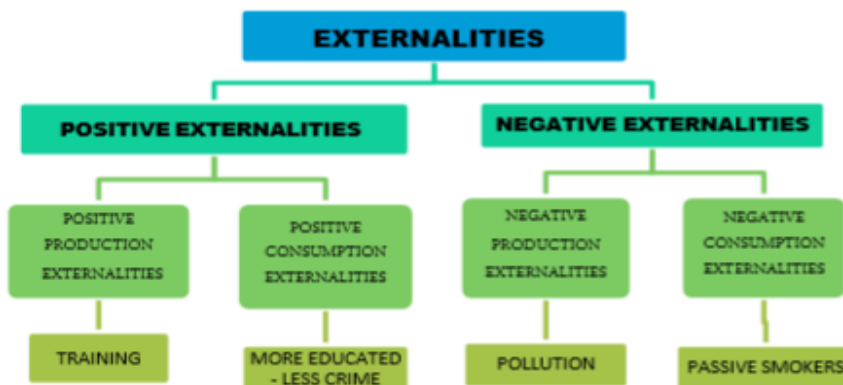
EXTERNALITIES

We have learnt from year 11 that the principle of markets has been the usual best way of allocating resources efficiently. This has been based and supported on Adam Smith's 1776 Book, 'An inquiry into the Nature and Causes of Wealth'. Smith theorised that sectors work as if they are guided by an 'invisible hand'. This invisible hand then directs us to intended market outcomes.

The equilibrium above works well for private goods but not for mixed goods. **Mixed goods** are goods which are neither public nor private goods. They are always produced and consumed in undesirable quantities. This is because they are either under or over-priced and over – produced or under-produced which causes market failure. Thus, in the midst of production and consumption, producers and consumers have somewhat deviated from the intended outcomes which are some other unplanned by products from the actual production and consumption. These **unplanned activities are the side effects of production and consumption which are referred to as externalities**.

The **externalities** which emit adverse impacts are known as negative externalities while the one which produce favourable impacts are referred to as positive externalities.

Figure 5.1 Type and Examples of Externalities



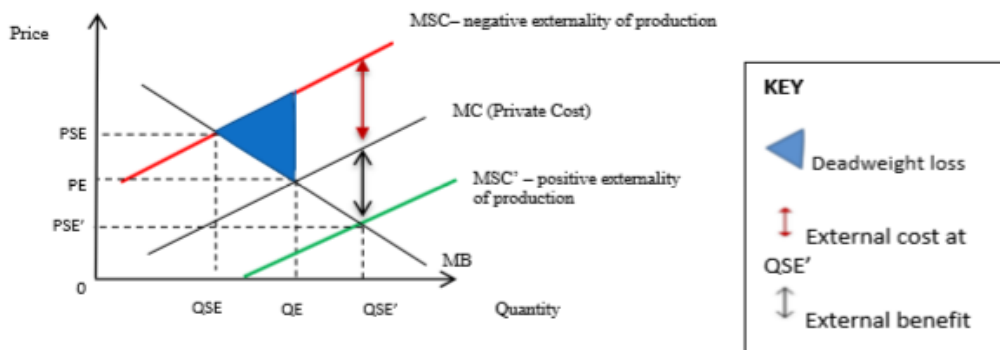
Impacts of Externalities of Production on the Market Outcomes

1. Negative Externalities of Production

We will refer to cement production to illustrate the impacts of negative externalities on the efficiency of market outcome. Cement production contributes to greenhouse gases through the production of carbon dioxide. It contributes to the adverse environmental and social impacts in our society which makes it a **negative externality**.

Impacts of Cement Production and Training in the Efficiency of Market Outcome

Figure 5.2 Impacts of Negative and Positive Externality of Production



The diagram above illustrates the impacts of externalities on the efficiency of the market outcome. This is usually explained using the social and private costs or benefits and is illustrated using the **marginal cost curve (MC)** or **marginal benefit (MB)**.

As a result of the adverse spill-over effect from the cement production, an external cost to the bystanders for the hazard caused is derived. Hence, the cost to society of producing the cement is higher than the cost to the cement producers which would shift the Marginal Cost (MC) curve leftwards by the amount of the external cost from MC to MSC as shown in figure 5.2. This results in a welfare loss to society, as shown by the blue shaded area which is the deadweight loss. The rational producer would choose the output where demand (MB) meets the MSC curve, which is the social equilibrium. Hence, efficient output level will be reduced to QSE while price will be increased to PSE.

Internalising Negative Externality of Production

The full brunt of the costs must be borne by the **producers** themselves.

- **Tax** – Imposition of tax on producers (eg. carbon tax) which will shift the supply curve leftwards or charges on plastic bags. This reduces the output and diminishing spill – overs while market equilibrium is moved towards social equilibrium.
- **Regulations** – Banning pollutions under regulations which can incur fines.

2. Positive Externalities of Production

Positive externalities refer occurs when the third party gains from the spill over production in which he or she is not charged. Therefore, they (**people who gain**) are known as **free riders**. Positive externalities are usually encouraged as they induce benefits which reduce the cost of production.

❖ Example 1:

Training of Staff: - The training of staff members of a particular firm would not only be enjoyed by the staff but the knowledge and skills gained would also be of use in their families or in their own communities.

❖ Example 2:

Research and Development: - which leads to new technology is also a potential by-product of production, which other firms can benefit from.

This reduces the cost of production hence reducing the MC by the amount of the benefit. This will shift the MC curve rightwards or downwards to MSC' as shown in Figure 5.2. Hence, it would be efficient to increase the output level to QSE' and hence the price will be reduced to PSE'.

Internalising Positive Externality of Production

1. Government can intervene by paying **subsidies** to encourage the production.
2. **Regulations that encourage production or reward** producers with other inducements can be put in place, such as tax write-offs as in the case of research and development.

Activity – Multiple Choice (5 marks)

1. The slope of the social cost (TSC) curve is given by the
A. total social benefit notation. B. marginal social cost element.
C. social desirable equilibrium point. D. negative externality of consumption.
2. The real cost of environmental protection is
A. a decrease in GDP B. increased leisure opportunities
C. an increase in positive spill overs D. a decrease in external benefits from forests
3. When one smokes in a crowded bus, the cost imposed on others is called
A. marginal cost. B. marginal benefit.
C. negative externalities. D. positive externalities.
4. The negative externalities of an industrial process are its
A. social cost to society B. private cost to society
C. total cost to the producers D. total cost of production
5. A spillover can be defined as the
A. free-rider situation B. effect on market equilibrium
C. cost or benefit that arises from a decision D. amount by which market price exceeds costs

Short Answers

1.



(i) What does the cartoon depict?

(1 mark)

(ii) In the view of above cartoon outline contemporary government policies to eliminate or reduce impacts of environmental externalities.

i. Define the term public provision.

(1 mark)

ii. State two problems associated with public provision.

(1 mark)

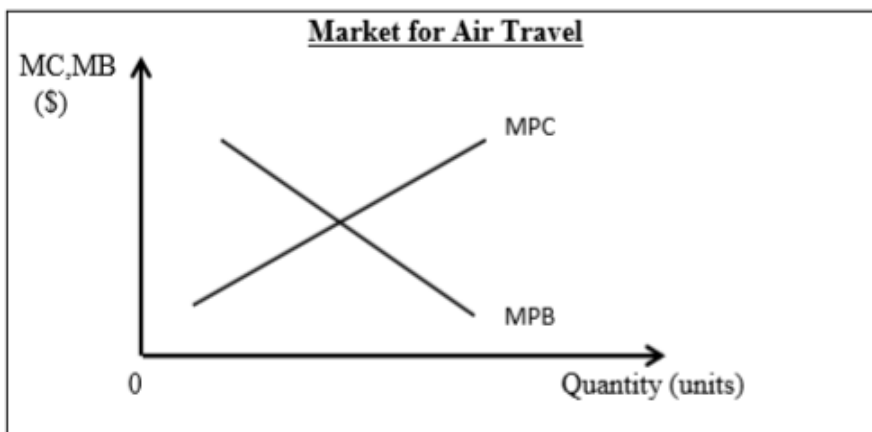
iii. Explain what user pay system mean.

(1 mark)

iv. Corporatization is one of the reform processes used by government to restructure the economy. State and explain another one.

(1 mark)

3. Residents living near major airports have been exposed to excessive noise levels from jet aircrafts. The diagram below shows the private market for air travel.



(i) Define the economic term social cost.

(1 mark)

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- (ii) On the diagram:
- a) Draw a marginal social cost curve which includes noise pollution.
Label the curve MSC.
 - b) Show the free market equilibrium price and quantity.
Label price as P_f and quantity as Q_f .

(2 marks)

THE END