

Market Failure:

Market becomes failure when market mechanism principles are unable to operate in case of some commodities and when private means contradict the social ends of an efficient allocation of resources. When price mechanism cannot be operated in determining the value of a commodity and Pareto Optimality cannot be applied in resource allocation the market failure emerges. Market failure comes about when people cannot define property rights clearly, cannot transfer rights freely, cannot exclude others from using the good, and also cannot protect our rights to use the good. Such types of conditions are reflected in public goods. Since environmental goods are public goods therefore market failure exists in case of environmental goods.

~~Sources~~ Reasons of market failure in case of environmental commodity:

There are several reasons for which market becomes failure in case of environmental commodity. These are discussed as follows:

Externalities : The presence of externalities in consumption of environmental goods leads to market failure. Externalities is defined as situations arising when the actions of some individuals have direct (positive or negative) effect on the welfare or utility of other individuals none of whom have direct control over that activity. An externality exists when the market price or cost of production excludes its social impact, cost or benefit.

(As for example, a gardener who invests in the beautification of his or her own property and in doing so raises the property value of neighboring houses. Here the neighbours are gaining real external benefit which is called positive externality. These positive externality arises due to application of non-excludability principle since neighbors are not excluded from the benefit derived from garden.)

Numbers of example are to be cited for explaining negative externality. As for example driving a car around the town creates numerous externalities. The exhaust contributes to air pollution, driving at rush hour adds to congestion, road rage increases the risk to owner and others.

The activities done by fish hatchery plant and paper mill are one of the examples of negative externalities. There is a fish hatchery plant that has to bear the cleaning up costs for the wastes discharged by a paper mill near to it. The cleaning up costs of the hatchery is external, since it is the result of an action imposed by the paper mill. The extra cleaning up costs incurred by hatchery is social cost which is higher than social benefit. This is negative externalities.

In the above examples the market fails because no exchange institution exists in which the person pays for the external benefits or pays a price for imposing the external costs. Since externalities lead to the divergence of social costs from private cost and of social benefits from private benefits. These divergence will lead to non - attainment of Pareto Optimality. According to Pareto in case of public goods when $MSC=MSB$, optimum level of public goods can be achieved. But due to existence of externalities in case of environmental commodity, there is the divergence between MSB and MSC for which Pareto Optimality cannot be achieved. Thus externality leads to market failure.

Public Goods:

Another cause of market failure is the existence of the characteristics of public goods in case of environmental goods. A public good exists when a person cannot be excluded from its provision and when one's consumption of the good does not reduce its availability to anyone else. These two conditions of

non-excludability and non-rival consumption separate a public good from a private good which is excludable and rival.)

Characteristics of Public Goods:

Non-excludability : In case of public goods non-excludability principle is applicable. Non-excludability exists when a person cannot be excluded from the consumption of a good. Since in case of public good everyone has the rights to consume it and therefore anyone can consume it without any payment. That is why it is impossible to exclude anyone from the consumption of such commodities.)

Non-rival consumption : Non-rival consumption is another example of public good. Non-rival consumption exists when one's consumption of the good does not reduce its availability to anyone else.)

Types of public good →

Public goods may be in two forms – pure and impure public goods. Both non excludable and non-rival principle is applicable in pure public goods while either non excludable or non-rival principle is applicable in impure public goods. Good quality air, wind, water, sunlight, global warming, pollution etc. are pure public goods. On the other hand, local parks, community pond, playground etc. are impure public goods.)

Free Riding Problem:

Since in case of environmental goods non-rival and non-exclusion principle is applied, the people can consume some environmental commodity freely. In such case one's consumption may not exclude the other. Therefore one can consume it as he wants for which over exploitation problem is emerged. This situation is considered as Free Riding Problem. Due to free riding problem the tragedy of commons is occurred.

asymmetric information
Incomplete and hidden information : Pareto Optimality assumes that producers and consumers have perfect information regarding market behaviour. But in the real world, there is incomplete information due to ignorance and uncertainty on the part of the buyers and sellers. Thus they are unable to equate social and private benefits and costs. Suppose a producer introduces a new anti-pollution device in the market. But it is very difficult for him to predict the current demand of his product. On the other hand consumers may be ignorant about quality and utility of this anti-pollution device. Thus information about market behaviour is insufficient or incomplete which retard the market in allocating the anti-pollution device efficiently.

Due to incomplete information a person cannot observe the hidden action of a person or the hidden quality of some good or service. Both types of hidden action retard the creation of markets that could be used to allocate resources to more efficient use such as the reduction of environmental risk.

Environmental risks like storage of pollution can create potential financial liabilities such as cleanup costs, medical expenses etc. Therefore a firm would like to pay to pass these risks on to a less risk-averse agent such as an insurer. But since the provision of insurance will also affect the individual's incentives to take production indicating the trade-off between risk-bearing and incentives, therefore the market for pollution liability insurance will be incomplete.)