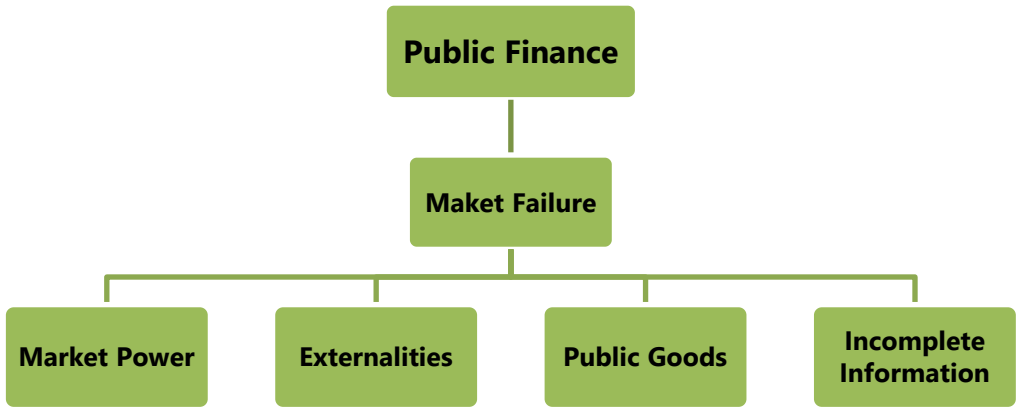
UNIT II: MARKET FAILURE

LEARNING OUTCOMES

At the end of this unit, you will be able to:

- Define the concept of market failure
- Describe the different sources of market failure
- Explain the role of externalities in welfare loss of markets
- Distinguish between different types of public goods and illustrate how they cause market failure
- Describe the free rider problem associated with public goods
- Appraise the role of incomplete information in generating market failure
- Evaluate government interventions for correcting market failure

UNIT OVERVIEW



2.1 INTRODUCTION

Before we go into the subject matter of market failure which is the focus of this unit, we shall examine two familiar events that are in some way connected with the phenomenon of market failure.

Case I

Sarva Shiksha Abhiyan (SSA) is a centrally sponsored scheme implemented by the Government of India in partnership with the state governments, for universalising good quality elementary education for all children in the 6-14 age groups in a time-bound manner. Through this programme, the government aims to provide opportunity for children to learn about and master their natural environment in order to develop their potential intellectually, spiritually as well as materially. The ultimate objective is to bring in social, regional and gender quantity.

Nearly everyone believes that providing basic education to all citizens is an important responsibility of the government. This is the reason why education is almost entirely administered and extensively financed by government.

Questions

- Why do you think governments should intervene to provide education?
- What do you think the outcome will be if it is left to private entrepreneurs?

Case II

In November 2016, the Central Pollution Control Board (CPCB), the nation's apex pollution control body, has come up with the 'Guidelines For Environmentally Sound Management (ESM) of End- of - Life Vehicles (ELVs)' with the recommendation that the Union Environment Ministry draft the necessary legislative framework for the sector considering the growing concern about the health and environmental hazards posed by them. CPCB advocates disposing of such vehicles in an environmentally friendly manner and recommends a system of "shared responsibility" involving all stakeholders—the government, manufacturers, recyclers, dealers, insurers and consumers.

The central board has called for periodic review of the registration of all vehicles by transport offices so that the environment is not harmed by the continued use of polluting vehicles as well as initiation of a massive awareness campaign aimed at sensitizing stakeholders like consumers about the environmental hazards posed by ELVs.

The above case is an example of how government departments and specifically constituted bodies address different issues to sustain our environment.

Question

Since citizens should ideally know the need for clean environment, why should governments interfere with the system?

2.2 THE CONCEPT OF MARKET FAILURE

The general belief is that markets are amazingly competent in organizing the activities of an economy as they are generally efficient and capable of achieving optimal allocation of resources. However, there are exceptions to this. Under certain circumstances, 'market failure' occurs, i.e. the market fails to allocate resources efficiently and therefore, market outcomes become inefficient.

Market failure is a situation in which the free market leads to misallocation of society's scarce resources in the sense that there is either overproduction or underproduction of particular goods and services leading to a less than optimal outcome. The reason for market failure lies in the fact that though perfectly competitive markets work efficiently, most often the prerequisites of competition are unlikely to be present in an economy. Market failures are situations in which a particular market, left to itself, is inefficient. We shall first try to understand why markets fail and later, in the subsequent unit, proceed to identify the role of government in dealing with market failure.

We need to appreciate the fact that there are two aspects of market failures namely, demand-side market failures and supply side market failures. Demand-side market failures are said to occur when the demand curves do not take into account the full willingness of consumers to pay for a product. For example, none of us will be willing to pay to view a wayside fountain because we can view it without paying. Supply-side market failures happen when supply curves do not incorporate the full cost of producing the product. For example, a thermal power plant that uses coal may not have to include or pay completely for the costs to the society caused by fumes it discharges into the atmosphere as part of the cost of producing electricity.

2.3 WHY DO MARKETS FAIL?

The pertinent question here is why do markets fail? There are four major reasons for market failure. They are:

- Market power,
- Externalities,

- Public goods, and
- Incomplete information

We shall discuss each of the above in detail.

2.3.1 Market Power

Market power or monopoly power is the ability of a firm to profitably raise the market price of a good or service over its marginal cost. Firms that have market power are price makers and therefore, can charge a price that gives them positive economic profits. Excessive market power causes the single producer or a small number of producers to produce and sell less output than would be produced in a competitive market. Market power can cause markets to be inefficient because it keeps price higher and output lower than the outcome of equilibrium of supply and demand. In the extreme case, there is the problem of non existence of markets or missing markets resulting in failure to produce various goods and services, despite the fact that such products and services are wanted by people. For example, the markets for pure public goods do not exist.

2.3.2 Externalities

We begin by describing externalities and then, proceed to discuss how they create market inefficiencies. As we are aware, anything that one individual does, may have, at the margin, some effect on others. For example, if individuals decide to switch from consumption of ordinary vegetables to consumption of organic vegetables, they would, other things equal, increase the price of organic vegetables and potentially reduce the welfare of existing consumers of organic vegetables. However, we should note that all these operate through price mechanism i.e. through changes in prices. The price system works efficiently because market prices convey information to both producers and consumers.

However, sometimes, the actions of either consumers or producers result in costs or benefits that do not reflect as part of the market price. Such costs or benefits which are not accounted for by the market price are called externalities because they are "external" to the market. In other words, there is an externality when a consumption or production activity has an indirect effect on other's consumption or production activities and such effects are not reflected directly in market prices. The unique feature of an externality is that it is initiated and experienced not through the operation of the price system, but outside the market. Since it occurs outside the price mechanism, it has not been compensated for, or in other words it is uninternalized or the cost (benefit) of it is not borne (paid) by the parties.

Externalities are also referred to as 'spillover effects', 'neighbourhood effects' 'third-party effects' or 'side-effects', as the originator of the externality imposes costs or benefits on others who are not responsible for initiating the effect.

Externalities may be unidirectional or reciprocal. Suppose a workshop creates earsplitting noise and imposes an externality on a baker who produces smoke and disturbs the workers in the workshop, then this is a case of reciprocal externality. If an accountant who is disturbed by loud music but has not imposed any externality on the singers, then the externality is unidirectional.

Externalities can be positive or negative. Negative externalities occur when the action of one party imposes costs on another party. Positive externalities occur when the action of one party confers benefits on another party. The four possible types of externalities are:

- Negative production externalities
- Positive production externalities
- Negative consumption externalities ,and
- Positive consumption externalities

Negative Production Externalities

A negative externality initiated in production which imposes an external cost on others may be received by another in consumption or in production. As an example, a negative production externality occurs when a factory which produces aluminum discharges untreated waste water into a nearby river and pollutes the water causing health hazards for people who use the water for drinking and bathing. Pollution of river also affects fish output as there will be less catch for fishermen due to loss of fish resources. The former is a case where a negative production externality is received in consumption and the latter presents a case of a negative production externality received in production. The firm, however, has no incentive to account for the external costs that it imposes on consumers of river water or fishermen when making its production decision. Additionally, there is no market in which these external costs can be reflected in the price of aluminum.

Positive production externalities

A positive production externality initiated in production that confers external benefits on others may be received in production or in consumption. Compared to negative production externalities, positive production externalities are less common. As an example of positive production externality received in production,

we can cite the case of a firm which offers training to its employees for increasing their skills. The firm generates positive benefits on other firms when they hire such workers as they change their jobs. Another example is the case of a beekeeper who locates beehives in an orange growing area enhancing the chances of greater production of oranges through increased pollination. A positive production externality is received in consumption when an individual raises an attractive garden and the persons walking by enjoy the garden. These external effects were not in fact taken into account when the production decisions were made.

Negative consumption externalities

Negative consumption externalities are extensively experienced by us in our day to day life. Such negative consumption externalities initiated in consumption which produce external costs on others may be received in consumption or in production. Examples to cite where they affect consumption of others are smoking cigarettes in public place causing passive smoking by others, creating litter and diminishing the aesthetic value of the room and playing the radio loudly obstructing one from enjoying a concert. The act of undisciplined students talking and creating disturbance in a class preventing teachers from making effective instruction and the case of excessive consumption of alcohol causing impairment in efficiency for work and production are instances of negative consumption externalities affecting production.

Positive consumption externalities

A positive consumption externality initiated in consumption that confers external benefits on others may be received in consumption or in production. For example, if people get immunized against contagious diseases, they would confer a social benefit to others as well by preventing others from getting infected. Consumption of the services of a health club by the employees of a firm would result in an external benefit to the firm in the form of increased efficiency and productivity.

Having discussed the nature of externalities in production and consumption, we shall now examine how externalities cause inefficiency and market failure. Before we attempt this, we need to understand the difference between private costs and social costs. Private cost is the cost faced by the producer or consumer directly involved in a transaction. If we take the case of a producer, his private cost includes direct cost of labour, materials, energy and other indirect overheads. As we have mentioned above, firms do not have to pay for the damage resulting from the pollution which they generate. As a result, each firm's private cost would be the direct cost of production only which does not incorporate externalities.

Social costs refer to the total costs to the society on account of a production or consumption activity. Social costs are private costs borne by individuals directly involved in a transaction together with the external costs borne by third parties not directly involved in the transaction.

Social Cost = Private Cost + External Cost

The presence of externalities creates a divergence between private and social costs of production. When negative production externalities exist, social costs exceed private cost because the true social cost of production would be private cost plus the cost of the damage from externalities. If producers do not take into account the externalities, there will be over-production and market failure. Applying the same logic, negative consumption externalities lead to a situation where the social benefit of consumption is less than the private benefit.

Externalities cause market inefficiencies because they hinder the ability of market prices to convey accurate information about how much to produce and how much to consume. Given that externalities are more often negative, we shall focus on them.

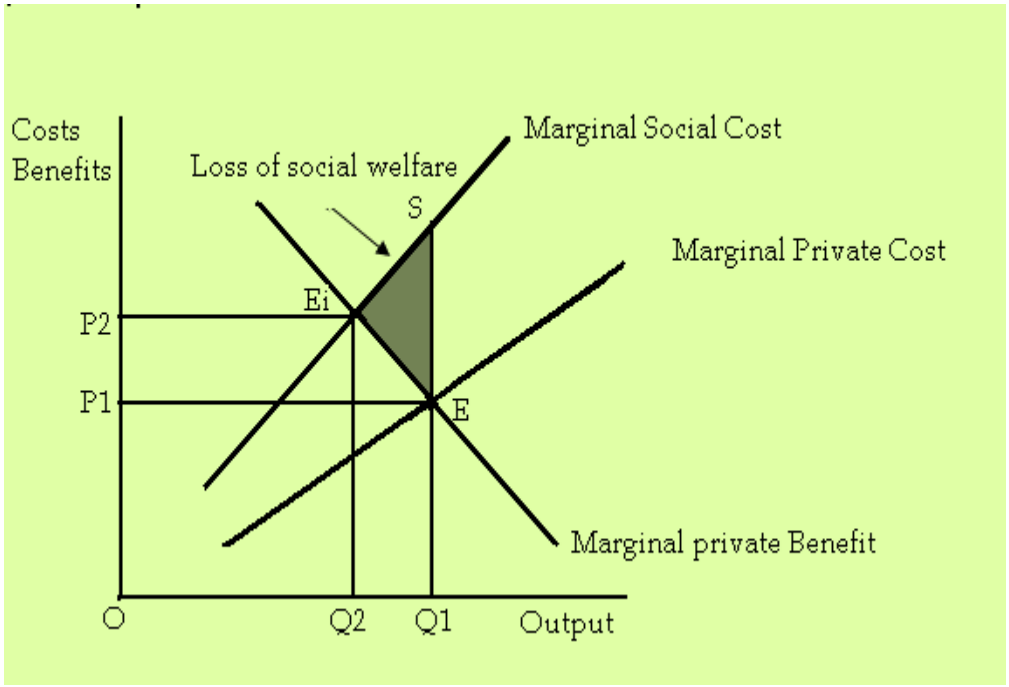
A market exchange assumes that the participants have total control over every aspect of their product and that the prices (or fees) they charge represent the full cost of production plus profit. As a matter of fact, the producers of products with extensive negative externalities are not fully accountable for the full cost of their production which includes private as well as social costs. Recall our earlier case of the aluminum factory which causes pollution of river water. As a matter of fact, the prices of aluminum tend to reflect only the private costs of the producer. Since externalities are not reflected in market prices, they can be a source of economic inefficiency. Production remains efficient only when all benefits and costs are paid for. Negative externalities impose costs on society that extend beyond the cost of production as originally intended by the producer. Without government intervention, such a producer will have no reason to consider the social costs of pollution. When firms do not have to worry about the negative externalities associated with their production, the result is excess production and unnecessary social costs. The problem, though serious, does not usually float up much because:

- The society does not know precisely who are the producers of harmful externalities
- Even if the society knows it, the cause-effect linkages are so unclear that the negative externality cannot be unquestionably traced to its producer.

The problem can be explained with the help of the figure below:

Figure 2.2.1

Negative Externalities and Loss of Social welfare



The equilibrium level of output that would be produced by a free market is Q1 at which marginal private benefit (MPB) is equal to marginal private cost (MPC). Marginal social cost (MSC) represents the full or true cost to the society of producing another unit of a good. It includes marginal private cost (MPC) and marginal social cost (MSC). Assuming that there are no externalities arising from consumption, we can see that marginal social cost (Q1S) is higher than marginal private cost (Q1E). Social efficiency occurs at Q2 level of output where MSC is equal to MSB. Output Q1 is socially inefficient because at Q1, the MSC is greater than the MSB and represents over production. The shaded triangle represents the area of dead weight welfare loss. It indicates the area of overconsumption. Thus, we conclude that when there is negative externality, a competitive market will produce too much output relative to the social optimum. This is a clear case of market failure where prices fail to provide the correct signals.

2.4 PUBLIC GOODS

Paul A. Samuelson who introduced the concept of 'collective consumption good' in his path-breaking 1954 paper 'The Pure Theory of Public Expenditure' is usually recognized as the first economist to develop the theory of public goods. A public good (also referred to as collective consumption good or social good) is defined as one which all enjoy in common in the sense that each individual's consumption of such a good leads to no subtraction from any other individuals' consumption of that good.

Before we go on to discuss the distinguishing features of public goods and how they differ from private goods, it is pertinent to first understand the characteristics of private goods.

2.4.1 Characteristics of Private Goods

- Private goods refer to those goods that yield utility to people. Anyone who wants to consume them must purchase them.
- Owners of private goods can exercise private property rights and can prevent others from using the good or consuming their benefits.
- Consumption of private goods is 'rivalrous' that is the purchase and consumption of a private good by one individual prevents another individual from consuming it. In other words, simultaneous consumption of a rivalrous good by more than one person is impossible.
- Private goods are 'excludable' i.e. it is possible to exclude or prevent consumers who have not paid for them from consuming them or having access to them. In other words, those who want to consume private goods must buy them at a price from its sellers. Excludability necessitates that consumers of private goods send the right signals in the market. A buyer of a private good is forced in a transaction to reveal what he or she is willing to pay for a good or a service.
- Private goods do not have the free rider problem. This means that the private godds will be available to only those persons who are willing to pay for it.
- Private goods can be parceled out among different individuals and therefore, it is possible to refer to total consumption as the sum of each individual's consumption. Therefore, the market demand curve for a private good is obtained by horizontal summation of individual demand curves

- All private goods and services can be rejected by the consumers if their needs, preferences or budgets change.
- Additional resource costs are involved for producing and supplying additional quantities of private goods
- Since buyers can be excluded from enjoying the good if they are not willing and able to pay for it, consumers will get different amounts of goods and services based on their desires and ability and willingness to pay. Therefore, whenever there is inequality in income distribution in an economy, issues of fairness and justice tend to arise with respect to private goods.
- Normally, the market will efficiently allocate resources for the production of private goods.

Most of the goods produced and consumed in an economy are private goods. A few examples are: food items, clothing, movie ticket, television, cars, houses etc.

You can make a list of ten such goods and check whether each of them satisfies all the above mentioned characteristics.

Having understood the features of private goods, we shall now proceed to consider the distinguishing characteristics of public goods.

2.4.2 Characteristics of Public Goods

- Public goods yield utility to people and are products (goods or services) whose consumption is essentially collective in nature. No direct payment by the consumer is involved in the case of pure public goods.
- Public good is non-rival in consumption. It means that consumption of a public good by one individual does not reduce the quality or quantity available for all other individuals. When consumed by one person, it can be consumed in equal amounts by the rest of the persons in the society. That is, your consumption of a public good in no way interferes with its consumption by other people. For example, if, you eat your apple, another person too cannot eat it. But, if you walk in street light, other persons too can walk without any reduced benefit from the street light.
- Public goods are non-excludable. Consumers cannot (at least at less than prohibitive cost) be excluded from consumption benefits. If the good is provided, one individual cannot deny other individuals' consumption. Provision of a public good at all by government means provision for all. For

example, national defence once provided, it is impossible to exclude anyone within the country from consuming and benefiting from it.

- Public goods are characterized by indivisibility. For example, you can buy chocolates or ice cream as separate units, but a lighthouse, a highway, an airport, defence, clean air etc cannot be consumed in separate units. In the case of public goods, each individual may consume all of the good i.e. the total amount consumed is the same for each individual.
- Public goods are generally more vulnerable to issues such as externalities, inadequate property rights, and free rider problems.

Once a public good is provided, the additional resource cost of another person consuming the goods is 'zero'. A good example is a Lighthouse near a sea shore to guide the ships. Once the beacon is lit, an additional ship can use it without any additional cost of provision.

Public goods are generally divided into two categories namely, public consumption goods and public factors of production. A few examples of public goods are: national defence, highways, public education, scientific research which benefits everyone, law enforcement, lighthouses, fire protection, disease prevention and public sanitation.

A unique feature of public goods is that they do not conform to the settings of market exchange. The property rights of public goods with extensive indivisibility and nonexclusive properties cannot be determined with certainty. Therefore, the owners of such products cannot exercise sufficient control over their assets. For example, if you maintain a beautiful garden, you cannot exercise full control over it so as to charge your neighbours for the enjoyment which they get from your garden. As a consequence of their peculiar characteristics, public goods do not provide incentives that will generate optimal market reaction. Producers are not motivated to produce a socially-optimal amount of products if they cannot charge a positive price for them or make profits from them. As such, though public goods are extremely valuable for the well being of the society, left to the market, they will not be produced at all or will be grossly under produced.

Now that we have understood the difference between private goods and public goods, we shall examine the implications of these characteristics on the production, supply and use of these goods. As mentioned above, ideally competitive markets have sufficient incentives to produce and supply private goods. Because of the peculiar characteristics of public goods such as indivisibility, non excludability and nonrivalry, competitive private markets will fail to generate economically efficient

outputs of public goods. That is why public goods are often (though not always) under-provided in a free market economy.

2.4.3 Classification of Public Goods

One approach to classify goods so as to establish taxonomy of different types of goods is to concentrate on the non rival and non excludable characteristics of public goods. The following table presenting the taxonomy of goods will help us understand the classification of goods.

	Excludable	Non-excludable
Rivalrous	A Private goods food, clothing, cars	B Common resources such as fish stocks, forest resources, coal
Non-rivalrous	C Club goods, cinemas, private parks, satellite television	D Pure public goods such as national defence

- Goods in category A are rival in consumption and are excludable. These are also known as pure private goods.
- Goods in category D which are characterized by both non-excludability and non-rivalry properties are called pure public goods. A pure public good is non -rival as well as non- excludable. The benefit that an individual gets from a pure public good does not depend on the number of users. The clarity of your radio reception, for example, is generally independent of the number of other listeners. Knowledge is another non-rivalrous good. Once something has been discovered, one person's use of that knowledge does not preclude others from applying the same knowledge. But, this is not the case with most private goods.
- Consumption goods that fall in category B are rival but not excludable. Common resources would come under this (explained in section 2.4.6 below) Let us take another example. Bees from the hives of different bee keepers collect nectar from the nearby orange garden. The blossom is rival as the nectar collected for one hive is unavailable to another. Even so, it may be inconceivable to try to deny any particular honey bee access i.e. the situation is non-excludable. The examples include public parks, public roads in a city etc.

- Goods in category C are non rival in consumption but are excludable. A toll booth may exclude vehicles unless payment is made. Yet, if the road is not congested, one car may utilize it with no loss of benefit even though the other cars are also consuming the road service. Similarly, admission to a cinema, swimming pool, music concert etc. has potential for exclusion, but if there is no congestion, each individual admitted may consume the services without subtracting from the benefit of others. A good example of this is DTH cable TV service or Digital goods. The consumption of these is non-rival in nature but exclusion of houlseholds who do not pay is feasible.

2.4.4 Pure and Impure Public Goods

The concept of pure public good is often criticized by many who point out that such goods are not in fact observable in the real world. They argue that goods which perfectly satisfy non rivalness and non-excludability are not easy to come across. For example, if the government provides law and order or medical care, the use of law courts or medical care by some individuals subtracts the consumption of others if they need to wait. As another example, we may take defence. If armies are mostly deployed in the northern borders, it may not result in the same amount of protection to people in the south.

There are many hybrid goods that possess some features of both public and private goods. These goods are called impure public goods and are partially rivalrous or congestible. Because of the possibility of congestion, the benefit that an individual gets from an impure public good depends on the number of users. Consumption of these goods by another person reduces, but does not eliminate, the benefits that other people receive from their consumption of the same good. For example, open-access Wi-Fi networks become crowded when more people access it. Impure public goods also differ from pure public goods in that they are often excludable.

An example of an impure public good would be cable television. It is non-rivalrous because the use of cable television by other individuals will in no way reduce your enjoyment of it. The good is excludable since the cable TV service providers can refuse connection if you do not pay for set top box and recharge it regularly..

We have seen above that impure public goods only partially satisfy the two public good characteristics of non-rivalry in consumption and non-excludability. The possibility of exclusion from the use of an impure public good has two implications.

1. Since free riding can be eliminated, the impure public good may be provided either by the market or by the government at a price or fee. If the

consumption of a good can be excluded, then, the market would provide a price mechanism for it.

2. The provider of an impure public good may be able to control the degree of congestion either by regulating the number of people who may use it , or the frequency with which it may be used or both.

Two broad classes of goods have been included in the studies related to impure public goods.

1. Club goods; first studied by Buchanan
2. Variable use public goods; first analyzed by Oakland and Sandmo

Examples of club goods are: facilities such as swimming pools, fitness centres etc. These goods are replicable and, therefore, individuals who are excluded from one facility may get similar services from an equivalent provider.

Variable use public goods include facilities such as roads, bridges etc. Once they are provided, everybody can use it. They can be excludable or non excludable. If they are excludable, some people can be discouraged from using it frequently by making them pay for its consumption. In doing so, the frequency of usage of the public good can be controlled. Since they are not replicable, the facility should be accessible to all potential users. Why should we exclude the enjoyment of roads, bridges etc of some people? The reason is the possibility of congestion due to large number of vehicles and the potential reduction of benefit to the users.

2.4.5. Quasi Public Goods (Mixed Goods)

This second approach to classification of impure public goods focuses on the mix of services that arise from the provision of the good. For example, if one gets inoculated against measles, it confers not only a private benefit to the individual, but also an external benefit because it reduces the chances getting infected of other persons who are in contact with him. You can observe here that the external effect associated with the consumption of a private good may have the characteristics of a public good.

Similarly, education will improve the individual's earning potential and at the same time, it may facilitate basic research creating nonrival non excludable knowledge and information which are public goods. Other examples of benefits to the society through education are improvement in decision making behaviour, provision of a screening device for the labour market to determine the quality of labour and better cultural environment and heritage for future generations. For example, other

things remaining the same, the students pursuing the chartered accountancy programme will have a demand curve for the programme at various prices. This reflects the private benefits which the students believe they would enjoy as a result of this education. These may be viewed as 'private return' on education and they depend in part on the income differential that students expect during their working life as a result of chartered accountancy education. However, there are likely other benefits such as, the possible addition which you may make to accounting knowledge and practices, the consultancy services you give to others, the policy recommendations that you may be able to put forth for a better tax or budgeting system etc. to mention a few. These have the characteristics of public good as everyone in the society can consume them without reducing the amount available for consumption by others. Obviously, your demand curve for the CA programme did not incorporate all these external effects.

The quasi-public goods or services, also called a near public good (for e.g. education, health services) possess nearly all of the qualities of the private goods and some of the benefits of public good. It is easy to keep people away from them by charging a price or fee. However, it is undesirable to keep people away from such goods because the society would be better off if more people consume them. This particular characteristic namely, the combination of virtually infinite benefits and the ability to charge a price results in some quasi-public goods being sold through markets and others being provided by government. As such, people argue that these should not be left to the market alone.

Markets for the quasi public goods are considered to be incomplete markets and their lack of provision by free markets would be considered as inefficiency and market failure.

2.4.6 Common Access Resources

Common access resources or common pool resources are a special class of impure public goods which are non-excludable as people cannot be excluded from using them. These are rival in nature and their consumption lessens the benefits available for others. This rival nature of common resources is what distinguishes them from pure public goods, which exhibit both non-excludability and non-rivalry in consumption. They are generally available free of charge. Some important natural resources fall into this category.

Since price mechanism does not apply to common resources, producers and consumers do not pay for these resources and therefore, they overuse them and cause their depletion and degradation. This creates threat to the sustainability of

these resources and, therefore, the availability of common access resources for future generations.

Economists use the term 'tragedy of the commons' to describe the problem which occurs when rivalrous but non excludable goods are overused, to the disadvantage of the entire world.

Examples of common access resources are fisheries, common pastures, rivers, sea, backwaters biodiversity etc. The earth's atmosphere is perhaps the best example. Emissions of carbon dioxide and other greenhouse gases have led to the depletion of the ozone layer endangering environmental sustainability. Although nations are aware of the fact that reduced global warming would benefit everyone, they have an incentive to free ride, with the result that nothing positive is likely to be done to correct the problem.

2.4.7. Global Public Goods

There are several public goods benefits of which accrue to everyone in the world. These goods have widespread impact on different countries and regions, population groups and generations. These are goods whose impacts are indivisibly spread throughout the entire globe.

The WHO delineates two categories of global public goods namely, final public goods which are 'outcomes', (e.g. the eradication of polio) and intermediate public goods, which contribute to the provision of final public goods.(e.g. International Health Regulations aimed at stopping the cross-border movement of communicable diseases and thus reducing cross-border health risks). Similarly, the World Bank identifies five areas of global public goods which it seeks to address: namely, the environmental commons (including the prevention of climate change and biodiversity), communicable diseases (including HIV/AIDS, tuberculosis, malaria, and avian influenza), international trade, international financial architecture, and global knowledge for development. The distinctive characteristic of global public goods is that there is no mechanism (either market or government) to ensure an efficient outcome.

2.4.8 The Free Rider Problem

We may be unfamiliar with the jargon 'free riding' but it is a familiar phenomenon in our day to day life. You might have noticed that when students are required to do a group project, some group members tend to escape the work and make others do the entire work. Those who escape assignment 'free ride' on the efforts of others.

The incentive to let other people pay for a good or service, the benefits of which are enjoyed by an individual is known as the free rider problem. In other words, free riding is 'benefiting from the actions of others without paying'. A free rider is a consumer or producer who does not pay for a nonexclusive good in the expectation that others will pay.

Public goods provide a very important example of market failure, in which the self interested behaviour of individuals does not produce efficient results. We shall now see how free riding is applicable in the case of public goods. Consumers can take advantage of public goods without contributing sufficiently to their production. The absence of excludability in the case of public goods and the tendency of people to act in their own self interest will lead to the problem of free riding. If individuals cannot be excluded from the benefit of a public good, then they are not likely to express the value of the benefits which they receive as an offer to pay. In other words, they will not express to buy a particular quantity at a price. Briefly put, there is no incentive for people to pay for the good because they can consume it without paying for it. There is an important implication for this behaviour. If every individual plays the same strategy of free riding, the strategy will fail because nobody is willing to pay and therefore, nothing will be provided by the market. Then, a free ride for any one becomes impossible.

On account of the free rider problem, there is no meaningful demand curve for public goods. If individuals make no offers to pay for public goods, then the profit maximizing firms will not produce them.

In fact, the public goods are valuable for people. If there is no free rider problem, people would be willing to pay for them and they will be produced by the market. As such, if the free-rider problem cannot be solved, the following two outcomes are possible:

1. No public good will be provided in private markets
2. Private markets will seriously under produce public goods even though these goods provide valuable service to the society.

2.5 INCOMPLETE INFORMATION

Complete information is an important element of competitive market. Perfect information implies that both buyers and sellers have complete information about anything that may influence their decision making. However, this assumption is not fully satisfied in real markets due to the following reasons.

- Often, the nature of products and services tends to be highly complex e.g. Cardiac surgery, financial products (such as pension products mutual funds etc).
- In many cases consumers are unable to quickly / cheaply find sufficient information on the best prices as well as quality for different products. Sometimes they misunderstand the true costs or benefits of a product or are uncertain about the true costs and benefits.
- People are ignorant or not aware of many matters in the market. Generally they have inaccurate or incomplete data and consequently make potentially 'wrong' choices / decisions.

Information failure is widespread in numerous market exchanges. When this happens misallocation of scarce resources takes place and equilibrium price and quantity is not established through price mechanism. This results in market failure.

2.5.1 Asymmetric Information

Asymmetric information occurs when there is an imbalance in information between buyer and seller i.e. when the buyer knows more than the seller or the seller knows more than the buyer. This can distort choices. For example, the landlords know more about their properties than tenants, a borrower knows more about their ability to repay a loan than the lender, a used-car seller knows more about vehicle quality than a buyer and some traders may possess insider information in financial markets. These are situations in which one party to a transaction knows a material fact that the other party does not. This phenomenon, which is sometimes referred to as the 'lemons problem', is an important source of market failure. With asymmetric information, low-quality goods can drive high-quality goods out of the market.

2.5.2 Adverse Selection and Moral Hazard

Adverse selection is a situation in which asymmetric information about quality eliminates high-quality goods from a market. One example of adverse selection is that of health insurance. The people who are most likely to purchase health insurance are those who are most likely to use it, i.e. people with unhealthy life styles and those with underlying health issues. The insurance company being aware of this raises the average price of insurance cover. This prices healthy consumers out of the market as healthy people will be unwilling to pay such high premium. The result is that only high risk individuals buy insurance. This is a market failure. Another example is the used car market i.e. the 'market for lemons'. The owner of

a car knows much more about its quality than anyone else. The buyer's willingness to pay for any particular car will be based on the 'average quality' of used cars. Anyone who sells a 'lemon' (an unusually poor car) stands to gain. The market becomes flooded with lemons. Eventually the market may offer nothing but lemons. The good-quality cars disappear because they are kept by their owners or sold only to friends. Briefly put, buyers expect hidden problems in items offered for sale, leading to low prices and the best items being kept off the market.

Moral hazard is opportunism characterized by an informed person's taking advantage of a less-informed person through an unobserved action. It arises from lack of information about someone's future behavior. Moral hazard occurs when an individual knows more about his or her own actions than other people do. This leads to a distortion of incentives to take care or to exert effort when someone else bears the costs of the lack of care or effort.

When someone is protected from paying the full costs of their harmful actions, they tend to act irresponsibly, making the harmful consequences more likely. Moral hazard occurs when a party whose actions are unobserved can affect the probability or magnitude of a payment associated with an event. For example: the insured consumers are likely to take greater risks, knowing that a claim will be paid for by the insurance company. The more of one's costs that are covered by the insurance company, the less a person cares whether the doctor charges excessive fees or uses inefficient and costly procedures as part of his health care. This causes insurance premiums to rise for everyone, driving many potential customers out of the market. This became a big issue in India when the health insurance providers and big private hospitals came in conflict and the issue was resolved by putting in place a 'third party administration' to settle the medical claims.

Asymmetric information, adverse selection and moral hazard affect the ability of markets to efficiently allocate resources and therefore lead to market failure because the party with better information has a competitive advantage.

2.6 CONCLUSION

Markets, do not always lead to efficiency. When there is a market failure, the market outcomes may be inefficient and government intervention can improve society's welfare. Government can ensure economic efficiency by providing the necessary legal and regulatory system that facilitates efficiency and /or it can intervene to correct specific market failures. The role of the government in combating market failures will be discussed in the next unit.

SUMMARY

- Market failure is a situation in which the free market fails to allocate resources efficiently in the sense that there is either overproduction or underproduction of particular goods and services leading to less than optimal market outcomes.
- The demand-side market failures are said to occur when demand curves do not take into account the full willingness of consumers to pay for a product**.** The supply -side market failures happen when supply curves do not incorporate the full cost of producing the product.
- The price system and markets work efficiently only if market prices convey information to both producers and consumers.
- There are four major reasons for market failure. They are: market power, externalities, public goods, and incomplete information.
- Excessive market power causes the single producer or small number of producers to produce and sell less output than would be produced and charge a higher price in a competitive market.
- Externalities, also referred to as 'spillover effects', 'neighbourhood effects' 'third-party effects', or 'side-effects', occur when the actions of either consumers or producers result in costs or benefits that do not reflect as part of the market price.
- Externalities cause market inefficiencies because they hinder the ability of market prices to convey accurate information about how much to produce and how much to buy. Since externalities are not reflected in market prices, they can be a source of economic inefficiency.
- Externalities are initiated and experienced, not through the operation of the price system, but outside the market and therefore, are external to the market.
- Externalities may be unidirectional or reciprocal. Externalities can be positive or negative. Negative externalities occur when the action of one party imposes costs on another party. Positive externalities occur when the action of one party confers benefits on another party.
- The four possible types of externalities are : Negative externality initiated in production which imposes an external cost on others. Positive production externality, less commonly seen, initiated in production that confers external

benefits on others. Negative consumption externalities initiated in consumption which produce external costs on others. Positive consumption externality initiated in consumption that confers external benefits on others. Each of the above may be received by another in consumption or in production. The firm or the consumer as the case may be , however, has no incentive to account for the external costs that it imposes on consumers

- Private cost is the cost faced by the producer or consumer directly involved in a transaction and includes direct cost of labour, materials, energy and other indirect overheads and does not incorporate externalities.
- Social cost is the entire cost which the society bears. Social Cost =Private Cost + External Cost.
- When negative production externalities exist, social costs exceed private cost. If producers do not take into account the externalities, there will be over-production and market failure and unwarranted social consequences.
- When firms do not have to worry about negative externalities associated with their production, the result is excess production and unnecessary social costs
- A public good (also referred to as a collective consumption good or a social good) is defined as one which all individuals enjoy in common in the sense that each individual's consumption of such a good leads to no subtraction from any other individual's consumption of that good.
- Private goods are 'rivalrous' 'and excludable' and less likely to have the free rider problem. Additional resource costs are involved for providing to another.
- Public goods consumption is indivisible, collective, nonrival, non-excludable and vulnerable to externalities and free rider problems.
- Public goods do not conform to the settings of market exchange and left to the market, they will not be produced at all or will be under produced. This is because the price becomes zero
- A pure public good is non-rivalrous and non excludable. Impure public goods are partially rivalrous or congestible. Because of the possibility of congestion, the benefit that an individual gets from an impure public good depends on the number of users.

- The provider of an impure public good may be able to control the degree of congestion either by regulating the number of people who may use it, or the frequency with which it may be used or both.
- The quasi-public goods or services, also called a near public good (for e.g. education, health services) possess nearly all of the qualities of the private goods and some of the benefits of public good. They exhibit market failure as incomplete markets.
- Common access resources or common pool resources are a special class of impure public goods which are non excludable as people cannot be excluded from using them. These are rival in nature and their consumption lessens the benefits available for others.
- Since price mechanism does not apply to 'common resources', producers and consumers do not pay for these resources and therefore, they overuse them and cause their depletion and degradation.
- Economists use the term 'tragedy of the commons' to describe the problem which occurs when rivalrous but non excludable goods are overused to the disadvantage of the entire universe.
- The incentive to let other people pay for a good or service, the benefits of which are enjoyed by an individual is known as the free rider problem.
- If every individual plays the same strategy of free riding, the strategy will fail because nobody is willing to pay and therefore nothing will be provided by the market.
- Complete information is an essential element of competitive market. But it is not fully satisfied in real world markets for goods or services due to highly complex nature of products.
- Asymmetric information occurs when there is an imbalance in information between buyer and seller i.e. when the buyer knows more than the seller or the seller knows more than the buyer. This can distort choices. With asymmetric information, low-quality goods can drive high-quality goods out of the market.
- Adverse selection is a situation in which asymmetric information about quality eliminates high-quality goods from a market. Buyers expect hidden problems in items offered for sale, leading to low prices and the best items being kept off the market.

- Moral hazard is opportunism characterized by an informed person's taking advantage of a less-informed person through an unobserved action.
- Asymmetric information, adverse selection and moral hazard affect the ability of markets to efficiently allocate resources and therefore, lead to market failure because the party with better information has a competitive advantage. Due to this the market collapses as transactions do not take place or very few transactions occur:

TEST YOUR KNOWLEDGE

I Multiple Choice Type Question

1. 'Market failure' occurs

   (a) when public goods are not sufficiently provided by public sector

   (b) the market fails to allocate resources efficiently and therefore market outcomes become inefficient.

   (c) people are not willing to pay and want to free ride

   (d) (a) and (b) above

2. Markets fail because

   (a) externalities are not accounted for in pricing and quantity decisions of firms

   (b) most often the prerequisites of competition are unlikely to be present in an economy

   (c) prices fail to reflect the true costs and benefits to the society

   (d) all the above

3. Market power

   (a) makes price equal marginal cost and produce a positive external benefit on others

   (b) can cause markets to be inefficient because it keeps price and output away from equilibrium of supply and demand

   (c) makes the firms price makers and restrict output so as to make allocation inefficient

   (d) (b) and(c) above

4. Markets do not exist

   (a) for pure public goods

   (b) for goods which have positive externalities

   (c) for goods which have negative externalities

   (d) none of the above

5. The unique feature of an externality is that it is

   (a) initiated and experienced, not through the operation of the price system but affects an external agent

   (b) initiated and experienced, not through the operation of the price system, but outside the market

   (c) initiated and experienced by the same entity, but causes decrease in social welfare

   (d) causes decreases in social welfare through the system of prices prevailing in the market

6. If a textile mill produces large amounts of negative externality, then which one of the following is possible?

   (a) The output of textile is too little when compared to the socially optimal quantity

   (b) The output of textile is too large when compared to the socially optimal quantity

   (c) The output of textile is not socially optimal as it is likely to be a regulated one

   (d) Any of the above

7. All but one of the following statements is incorrect. Identify the correct statement.

   (a) When there is a negative externality, the social marginal cost will exceed private marginal cost

   (b) When there is a positive externality the social marginal cost will exceed private marginal cost

   (c) Common property resources are non rival and non excludable public goods so that the problem of sustainability becomes grave

(d) Goods that are rival in consumption and are non excludable are known as private goods

8. In case of a positive externality

(a) the social marginal cost will exceed private marginal cost

(b) the social marginal cost will be equal to private marginal cost

(c) the social marginal cost will be less than private marginal cost

(d) the social marginal cost has no relation to private marginal cost

9. Which of the following statement is correct in respect of externalities?

(a) When social marginal costs are equal to private marginal costs, the level of output will be equal to the socially optimal level

(b) When social marginal costs are less than private marginal costs, the level of output will be lower than the socially optimal level

(c) When social marginal costs are greater than private marginal costs, the level of output will be higher than the socially optimal level

(d) All of the above.

10. Match the following

(a)	Pure public goods	i)	Excludable and rival
(b)	Club goods	ii)	Non excludable and rival
(c)	Common resources	iii)	Non excludable and non rival
(d)	Private good	iv)	Non rival and excludable

(a) {a) i)}; {b) ii)}; {c) iv)}; {d) iii)}

(b) {a) ii)}; {b) i)}; {c) iii)}; {d) iv)}

{a) iii)}; {b) i)}; {c)ii)}; {d) iv)}

(d) {a) iii)}; {b) iv)}; {c) ii)}; {d) i)}

11. Pollution is an instance of market failure

(a) because the equilibrium price is higher than the efficient price

(b) because the equilibrium price is less than the efficient price

(c) because property rights are poorly distributed

(d) because the market does not produce enough of the good

12. An adequate amount of a pure public good will not be provided by the private market because of

    (a) the existence of negative externalities

    (b) governments would any way produce them

    (c) There are restrictions as well as taxes on the private market

    (d) The possibility of free riding

13. The free rider problem arises because of

    (a) ability of participants to produce goods at zero marginal cost

    (b) marginal benefit cannot be calculated due to externalities present

    (c) the good or service is non excludable

    (d) general poverty and unemployment of people

14. Which of the following is an example of an impure public good?

    (a) a lighthouse provided by government

    (b) a congested highway during peak hours

    (c) a polio vaccination program sponsored by the government

    (d) national defence and the security offered by it

15. A situation where a pharmaceutical company has full information regarding the risks of a product, but continues to sell it is a case of

    (a) asymmetric information

    (b) moral hazard

    (c) free riding

    (d) (a) and (c) above

16. If an individual tends to drive his car in a dangerously high speed because he has a comprehensive insurance cover, it is a case of

    (a) free riding

    (b) moral hazard

    (c) negative externality

    (d) efficiency

17. Read the following statements

I. Common resources are pure public goods which are non rival

II. Since price mechanism does not apply to common resources, producers and consumers do not pay for these resources

III. Self-interest makes them overuse the common resources and cause their depletion and degradation

IV. The common resources impure public goods which are excludable but non rival

(a) Statement I alone is correct

(b) Statements I and IV are correct

(c) Statements II and III are correct

(d) Statements I ,II and III are correct

18. Market failure will never occur in a

(a) Socialist economy which is developed

(b) Unplanned economy which is under developed

(c) Capitalist economy which is developed

(d) None of the above

II Short Answer Type Questions

1. Explain the term market failure
2. Explain, with the aid of examples, the main characteristics of private goods.
3. Identify a pure public good using the criteria for identification
4. Explain the free rider problem. Give examples
5. Public goods do not use up extra resources as additional people consume them. Why?
6. Why do economists use the word external to describe third-party effects that are harmful or beneficial?
7. Explain why environmental pollution is regarded as a source of market failure.
8. Define externalities. Why are they considered as a source of market failure?
9. Distinguish between positive and negative externalities.

10. Appraise the role of incomplete information in generating market failure.
11. What do you understand by externalities in consumption?
12. What criteria are used to distinguish between pure and impure public goods?
13. Explain the term quasi public goods
14. How can social costs be differentiated from private cost?
15. What is the consequence of a negative externality on price and output?
16. How does the presence of positive externality influence price and output?
17. Describe the term 'Tragedy of Commons'
18. Define common resources. Why are they overused?
19. Discuss the importance of the distinction between private costs and social costs.
20. Describe, using examples, common access resources
21. Why are health and education not pure public goods?

III Long Answer Type Questions

1. Define the concept of market failure. Describe the different sources of market failure
2. Explain the different types of externalities? Illustrate how externalities lead to welfare loss of markets
3. Describe why markets have incentives to produce private goods?
4. Why do markets fail to produce public goods? Illustrate your answer.
5. Distinguish between different types of public goods. How do public goods cause market failure?
6. Explain using diagram and examples, the concepts of negative externalities of production and consumption, and the welfare loss associated with the production or consumption of a good or service.
7. Explain, with the aid of examples, the main characteristics of merit goods.
8. Describe the free rider problem associated with public goods. What would be the outcome? Give examples

9. 'The existence of poverty in economically less developed countries creates negative externalities through over-exploitation of land for agriculture, and this poses a threat to sustainability'. Elucidate

IV Application Oriented Questions

1. Identify the market outcomes for each of the following situations

   (a) A few youngsters play loud music at night. Neighbours may not be able to sleep.

   (b) Ram buys a large SUV which is very heavy

   (c) X smokes in a public place

   (d) Rural school students given vaccination against measles

   (e) Traffic congestion making travel very uncomfortable

   (f) Piracy of computer programs

   (g) Some species of fish are now getting extinct because they have been caught indiscriminately.

   (h) The municipality provides sirens four times a day

   (i) Burglar alarms are installed by many in your locality

   (j) Global warming increases due to emissions of fossil fuels

ANSWERS/HINTS

I Multiple Choice Type Questions

1.	(b)	**2.**	(d)	**3.**	(d)	**4.**	(a)	**5.**	(b)	**6.**	(b)
7.	(a)	**8.**	(c)	**9.**	(c)	**10.**	(d)	**11.**	(b)	**12.**	(d)
13.	(c)	**14.**	(b)	**15.**	(a)	**16**	(b)	**17.**	(c)	**18.**	(d)

IV Application Oriented Questions

(a) Negative externality, overproduction

(b) Negative externality, environmental externality, wear and tear of roads, increased fuel consumption, added insecurity imposed on others

(c) Negative externality, overproduction

(d) Public good, positive externality

(e) Negative externality

(f) Unpatented computer programs have characteristics very much like a public good and therefore market failure.

(g) The problem of the commons –The tragedy of commons

(h) Sirens have all characteristics of public goods. People will free ride – market failure.

(i) Positive externality, free riding.

(j) Negative externality.