

this tell you about the allocation of resources achieved by the market when there is a positive consumption externality? **(d)** Show the welfare loss created by the positive consumption externality in your diagram, and explain what this means.

- 2 Provide some examples of positive production externalities.
- 3 For each of the examples you provided in question 2, explain some methods that could be used to correct the externality.
- 4 How does a positive consumption externality differ from a positive production externality?
- 5 **(a)** Explain the meaning of a merit good, and provide examples. **(b)** How can underprovision of merit goods be corrected?
- 6 What policy options are available to governments wishing to correct a positive consumption externality?
- 7 Discuss advantages and disadvantages of the policy measures that governments can use to correct positive externalities of production and consumption.

## 5.5 Lack of public goods

### Market failure and public goods

#### Public goods versus private goods: rivalry and excludability

- ◆ Using the concepts of rivalry and excludability, and providing examples, distinguish between public goods (non-rivalrous and non-excludable) and private goods (rivalrous and excludable).

To understand what public goods are, it is useful to consider the definition of private goods. A **private good** has two characteristics:

- It is **rivalrous**: its consumption by one person reduces its availability for someone else; for example, your computer, textbook, pencils and clothes are rivalrous, because when you buy them, another person cannot buy the same ones; most goods are rivalrous.
- It is **excludable**: it is possible to exclude people from using the good; exclusion is usually achieved by charging a price for the good; if someone is unwilling or unable to pay the price, he or she will not have the benefit of using it; most goods are excludable.

Since most goods are rivalrous and excludable, it follows that most goods are private goods.

A **public good** has the following two characteristics:

It is **non-rivalrous**; its consumption by one person does not reduce consumption by someone else.

It is **non-excludable**; it is not possible to exclude someone from using the good.

Goods that are non-rivalrous and non-excludable are also known as *pure public goods*. For example, a lighthouse is non-rivalrous, because its use by one person does not make it less available for use by others. Also, it is non-excludable, because there is no way to exclude anyone from using it. Other examples of public goods include the police force, national defence, flood control, non-toll roads, fire protection, basic research, anti-poverty programmes and many others.

#### Public goods and the free rider problem

- ◆ Explain, with reference to the free rider problem, how the lack of public goods indicates market failure.

How do public goods relate to market failure? In the case of excludable goods, it is possible to prevent people from buying and using a good simply by charging a price for it; those who do not pay the price do not buy it and do not get to use it. Therefore, private firms have an incentive to provide excludable goods because they can charge a price for them, and therefore can cover their costs. Non-excludable goods differ: if a non-excludable good were to be produced by a private firm, people could not be prevented from using it even though they would not pay for it. Yet no profit-maximising firm would be willing to produce a good it cannot sell at some price. As a result, the market fails to produce goods that are non-excludable, giving rise to resource misallocation, as no resources are allocated to the production of public goods.

Public goods illustrate the **free rider problem**, occurring when people can enjoy the use of a good without paying for it. The free rider problem arises from non-excludability: people cannot be excluded from using the good. Public goods are a type of market failure because due to the free rider problem, private firms do not produce these goods: the market fails to allocate resources to their production.

## Quasi-public goods (public goods that are not 'pure')

Some goods do not fit neatly into the category of private goods or public goods. They can be considered to be 'impure' public goods, also known as 'quasi-public goods'. These goods are:

- non-rivalrous (like public goods), and
- excludable (like private goods).

Examples include public museums that charge an entrance fee and toll roads. All these are excludable because consumers must pay to use them. Since the price system can be made to work here to exclude potential users, they could be provided by private firms. However, they all have very large positive externalities, thus justifying direct government provision.

## Correcting the market's failure to provide public goods

### Implications of direct government provision

- ◆ Discuss the implications of the direct provision of public goods by the government.

We have seen that the market fails to allocate resources to the production of public goods. This means the government must step in to ensure that public goods are produced at socially desirable levels. Thus public goods are directly provided by the government, are financed out of tax revenues and are made available to the public free of charge (or nearly free of charge).

Government provision of public goods raises some issues of choice about (a) which public goods should be provided, and (b) in what quantities they should be provided. These issues are similar to what was noted above in connection with direct government provision and subsidies for goods with positive externalities (page 118). Limited government funds force choices on what public goods to produce, and each choice has an opportunity cost in terms of other goods and services that are foregone (or sacrificed). Here, too, the government must use economic criteria to decide which public goods will provide the greatest social benefits for a given amount of money to be spent on providing the goods. However, in the case of public goods, governments face a major additional difficulty in calculating expected benefits. With private goods that are provided or subsidised by the government, it is possible to make estimates of expected benefits by using the market price of the

good. (Remember the market price of a good reflects the benefits consumers receive and so reveals its value to consumers.) Therefore, the government can use the market price of private goods with positive externalities to estimate benefits and their value to consumers, but with public goods there is no such possibility as they are not produced by the market (private firms) and have no price.

This means the government must try to estimate the demand (or 'price') of public goods through such means as votes or surveys of people who are asked how much a good would be worth to them. This information is used in *cost-benefit analysis*, which compares the estimated benefits to society of a particular good with its costs. If the total benefits expected to arise from a public good are greater than the total costs of providing it, then the good should be provided. If benefits are less than costs, then the good should not be provided. Assuming that cost-benefit analysis indicates a public good should be provided, the decision on how much of it to provide is made by comparing marginal benefits with marginal costs: the public good should be provided up to the point where  $MB = MC$ .

Whereas the costs of providing a public good are relatively easy to estimate, there are clear difficulties in estimating benefits. A major difficulty arising with surveys is that people who really want something are likely to exaggerate its value. Therefore, cost-benefit analysis is a very rough and approximate method used to make choices about public goods.

### Test your understanding 5.7

- 1 (a) Explain the meaning of rivalry and excludability. (b) How do these concepts relate to the distinction between public goods and private goods?
- 2 Provide some examples of public goods, and explain how they relate to the concepts of rivalry and excludability.
- 3 (a) What are quasi-public goods? (b) How can they be defined in terms of rivalry and excludability?
- 4 Use the concept of resource allocation and the free rider problem to explain how public goods are a type of market failure.
- 5 (a) How do governments respond to the lack of public goods? (b) What are the implications of direct government provision?