MARKET FAILURE ANALYSIS: PUBLIC GOODS AND EXTERNALITIES

INTRODUCTION

Public goods, Private goods, mixed goods, and Merit goods

In this section we shall try to explore different types of goods and their concepts which have bearing on public expenditure decisions. This is important because it has welfare implication and largely concern with the society. Herein we shall examine the nature of public goods and understand that how they differ from private goods and also see the nature of other goods.

Public goods

A pure public good is one whose consumption by one individual does not reduce the consumption of others or of the society. No individual can prevent others to consume such good. Let us take an example; Let y indicates the total quantity supplied of pure public good, Y_A shows the quantity consumed by individual A and Y_B the quantity consumed by individual B, then we can write: $Y = Y_A = Y_B$. The equality signs show that there is no extra cost in supplying a given quantity of a public good to addition people, however, the production of additional units of such a good would involve extra cost.

Private goods

Private good is one whose consumption by one individual would reduce its supply for others. For given amount of good if consume more of it by A then less is left for B, e.g., if more bread is consume by A from the given, then less would be available for B. Similarly if more steel is consumed by present generation, then less would remain for the future generation. Let Z indicate the total supply of pure private good, then we can write: $Z=Z_A+Z_B$, where Z_A is amount consume by individual A and Z_B is amount consume by B.

Mixed goods

In real life there are few pure public good and pure private good. There are goods in real world which are public but with private content and there are also goods which are private but with public content. For example, a public road or footpath engaged by tea stall or encroachment of some portion of public good by private individual is a public good with private content. Similarly my home TV is my private good but my neighbour's children come and they also enjoy it, it becomes private good with public content. Such observations of real life situations show that there are a whole range of mixed goods, whereas pure public and pure private goods are extremes of these situations.

The Nature of Public goods

There are two main features of pure public goods:

(a) Non-rivalness in consumption

If a public good is supplied to one individual, it is at the same time made available to others at zero cost. This is true of defense, light houses and public protection. Such goods are indivisible in the sense that the benefits that each user drives from them cannot be measured, nor can the actual number of users of such goods be identified.

(b) Non-exclusion

In case of pure public good individual A cannot exclude individual B from consuming it, Whether B wants it or not. This implies that public goods are impossible to reject: e.g. no one individual can restrict the use of that good by others, i.e. passing over the bridge or entering into public garden or public library.

Only pure public good will exhibits both of above characteristics. The degree of 'publicness' of other public goods can be restricted by either spatial or capacity limitations. They can be explained as:

(a) Spatial Limitations

The degree of 'publicness' may depend on the geographical area, which a given public good is able to benefit. For example, fire protection is likely to be non-rival in a compact geographical area, but once the area is enlarged the 'publicness' element disappears. Another example is defense and light-house services are used by residents of border and coastal areas.

(b) Capacity limitations

The number of people able to enjoy a public good is dictated by the limits of its capacity. e.g. Public halls, a road bridge, having limited capacity, beyond that it become congested and lose its non-rival characteristics.

Linkages between private and public goods

These linkages are shown by the table, which can depict the different cases of pure public, private goods and mixed goods

	Excludable	Non-excludable
Rival	Case 1	Case 2
Non-rival	Case 3	Case 4

From this table we can identify for cases, showing pure public, pure private and the mixed goods.

Case-1 (rival and excludable)

It is clear cut example of a pure private good, such as loaf bread whose consumption by individual A necessarily reduces its supply to individual B. When A pays the price for the loaf, this entitles A to exclude B from consuming it.

Case-2 (rival and non excludable)

This is the case of private good with public content. As an example, consider a bee-keeper and a gardener: the bee keeper is unable to select which flowers the bees will pollinate and gardener is unable to choose which bees should get the nectar for honey (non-exclusion in both cases). Once a given swarm of bees is engaged in pollinating the nursery of one flower grower, however, they cannot at the same time be expected to benefit another nursery (rival consumption).

Case 3 (non-rival and excludable)

This is an example of public goods with private goods-a situation of private provision of goods which have a public content and the public provision of goods with a private good content. Consider a cricket stadium with a capacity crowd of 60,000 spectators. Up to this capacity, watching a match is non-rival. It is made excludable by fencing and by charging tickets. The same argument applies to theaters and cinemas. There are goods provided by government which has a private content e.g. National Health Services, or poverty elimination programmes-the benefits of such provision is open for all, but to only an identified group.

Case 4 (non-rival and non excludable)

This is a case of pure public goods, like defense, lighthouse, bridges and public utilities.

Merit goods Vs Demerit goods

Merit goods are goods that give merit to the society i.e. health education, wellbeing, civility and culture as well as good virtues. It is widely available for the social benefits that it provides. The main examples of merit goods are fire protection, low price houses to poor, public lavatory and education.

There are certain bad products in the society. They are the demerit goods. That includes alcohol, tobacco. Demerit goods are discouraged by laws and legislations.

Mixed goods and the economic theory of club

As we have seen that there are neither pure public good nor pure private good. There are mixed goods like clubs, road-bridges and hospital etc. People voluntarily join clubs. Voluntary clubs have limitations in terms of both capacity and geographical setting. In a club the cost is shared by the members. Sharing costs illustrates both a willingness to pay and the principle of the exclusion of non-members from the enjoyment of the facilities. The purpose of the club is to exploit the economics of scale associated with a particular facility.

Differences in the demand for private and public goods

Demand for private goods

In a market the consumers of private goods buy different quantities but normally pay the same price, hence the market demand curve for such goods is derived by summing up individual demand curves horizontally.



tained by the horizontal summation of the $D_B D_B$. The figure shows the derivation of a simple two person economy, with the two A's demand curve while $D_B D_B$ represents B's and for x is equal to oq_A and B's demand is

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equal to oq_B : the total market demand at price OP must be $oq_A + oq_A = oq_M$. The market demand curve $D_M D_M$ is found by adding A's and B's demand together at every price in other wards by horizontal summation.

Notice that the marginal benefits derived by the two people are the same, indicated on the graph by α and β , and that in turn are equal to the market marginal valuation δ . These marginal benefits are all equal to the providing price OP.

Demand for Public good

The market demand $D_M D_M$ for a public good is obtained by the vertical summation of the individual demand curves, $D_A D_A$ and $D_B D_B$. Individuals may place different valuations on the same quantity of a public good. In this case, A and B are willing to pay the price OP_1 and OP_2 respectively for the quantity Q^* .



Since each additional demand unit of a public good benefits everyone, we must add all the individuals valuations placed on extra units of such a good in order to obtain its market demand curve. To find society's willingness to pay, the prices individuals would be willing to pay if they revealed their true preferences must be added. Graphically, this means that individual demand curves must be summed vertically, as shown in figure. The graph shows an economy with two persons, A and B. The $D_A D_A$ and $D_B D_B$ represent the two individuals demand curves for the public good y. The market demand curve is shown by $D_M D_M$. Consider the quantity OQ^* . Individual A is willing to pay the price OP_1 and individual B is willing to pay OP_2 price for the same quantity. The marginal benefit derived from the good by the two individuals differs. Thus, the price which society as a whole is prepared to pay for the quantity OQ^* is $OP_3=OP_1+OP_2$. If MC represents the social and private marginal cost of producing the public goods then the interaction of MC and $D_M D_M$

Since there is a large numbers of people consuming public goods, there is little incentive for each individual to reveal his true preference. Unlike private goods, there exists no identifiable unit of measurement for many public goods e.g, defense, Police, education and health.

One important policy conclusion emerging from the discussion of the demand pattern of the two types of goods is worth noting given the goals of social welfare maximization, it must be determined whether the most efficient unit of supply of public goods is the central government, a local authority, a public corporation or even private sector firm. For example, street lighting and public parks are probably most efficiently supplied by the local authorities: they are in a better position to estimate the demand for these amenities and can more easily compare the relevant cost and benefits where the benefits are diffused and widespread, however, the most efficient unit of supply may be the central government: this is found in the cases of external security and nuclear energy development, for example.