

## **Economic Assignment**

## Part –B

### Negative Externalities in the economy and Corrective measures

**Executive summary:** the objective of the study is to discuss the impact of negative externalities in the economy. The society incurs the social welfare deadweight loss because of the existence of negative externalities. For instance pollution is generated because of industrial growth. Manufacturers and consumers are only bearing the private cost. But the social cost of pollution is borne by the society. That is why government intervention is needed. The case study on Indian agricultural sectors showed that the ground water level is continuously decreasing because of over extraction. Here government intervention was not very successful to prevent the over usage of ground water. The study recommended market mechanism to solve the problem. Through the negotiation process the negative externalities can be addressed.

Ans (a)

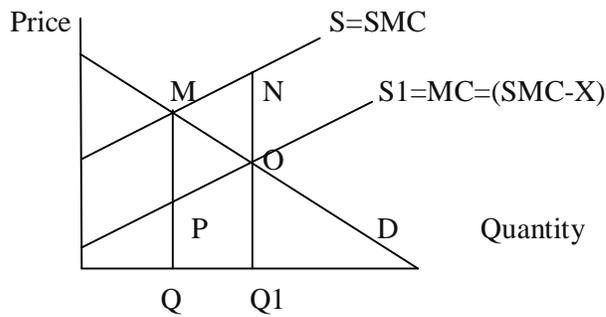
**Introduction:** Externality in economy occurs when the benefit or cost that affects a party who does not choose to incur the benefit or the cost. Nicholas (2006) argued that, if the external factor benefits the business organisation then it is termed as the positive externalities but when it imposes a cost to the organisation then it is considered as the negative externalities.

**Negative externalities in the market:** A negative externality takes place when a business organisation or an individual does not have to pay the full cost for the decision (Varian, 1994). If a commodity or service has negative externality then the extra cost is generally born by the society. The cost to society is much more than the cost for consumer. Buyer's decision is based on the marginal benefit and marginal cost associated to the product. Consumers generally omit the social cost as he is not liable to pay the social cost. However it is true that as an integral part of the society everybody is paying the social cost indirectly. It is also termed as external cost or external diseconomy.

When any market in unregulated the occurrence of negative externalities gets increased. Producers generally do not take the responsibility for the existence of negative externalities. They just casually pass it on the society. By ignoring social cost, producers keep their marginal cost down. That is why they able to produce and sell a higher number of goods. Otherwise if producers had to include the social cost then the marginal cost of production could have gone up and the profitability issue would have hampered. Private cost +external cost =social cost

Pollution is the common example for negative externalities in business. For instance thermal power plants emit a lot of pollutants in the air and ground. The people living near the thermal power plants suffer from a lot of health problems like allergy, asthma, respiratory problems. Apart from the health issues the pollutants and chemicals also lower the fertility of agricultural lands. The promoters of the plants do not bear the cost for health or other losses. The people surrounding the area have to the social cost. Smoking cigarettes to driving a car, the environment is getting polluted due to it. Water pollution, noise pollution and other problems created by industries are example of negative externalities in market.

Chart -1: Marginal cost, social marginal cost and negative externalities



In the diagram the axes represents price and quantity. One Demand (D) curve and two supply curves (S and S1) are there. Here S represents the Social Marginal Cost (SMC). S1 is the producer's Marginal Cost (MC). The difference between S and S1 is the external Cost. So,  $SMC = MC + X$ . In a normal situation the producer is supposed to produce Q quantity of goods. But with the same demand function the producer is able to produce and sell a higher quantity of goods (Q1) because the producer is enjoying social marginal cost. Because of the negative externalities a welfare deadweight loss (MNO) has been incurred.

### **Government intervention**

These negative externalities cause market inefficiency. Even in some cases the market may fail due to market externalities. So action should be taken to stop that and save market mechanism. Barthold (1994) address these problem government intervention is needed. The most common form of government intervention is imposing tax and giving subsidies. In case of negative externalities tax is generally imposed to increase the price. On the other hand, in case of positive externalities subsidies are given to bring down the price. Tax is imposed for basically two reasons; for revenue collection and to bring behavioural change among producers and consumers.

### **Corrective measures**

There are many ways to address negative externalities such as law, government provisioning and Piguian tax.

**Law:** Controlling pollution by applying law is called 'command and control'. Each and every government has many corrective laws such as industrial emission law, automobile emission law, industrial safety and hazardous material treatment law etc. For every cases dos, don'ts, procedures and limits are mentioned. It includes targets, standards and process requirements. But unless and until these are highly regularised and checks and balance are in order it is hard to implement. However if it is implemented properly then it can bring good result.

**Provisioning:** Government provisioning is basically making facilities to the society. By making hospitals or giving special grants and packages these problems can be addressed. But it is seen that generally these kinds of initiatives are very small compared to requirement. However the actual problem is not solved here because it does not hit the original source of the problem.

**Tax:** The concept of tax says that make the polluter pay. It increases the private cost of consumption. As a result it can be expected that the demand and consumption of that particular good will come down as the price will rise. Vehicle excise duty and road taxes are example of it as emission take place from automobiles. But in this case as well the route of the problem is not addressed. It is seen that the number of automobiles have increased over time amidst taxes. Though there are huge taxes on cigarettes and tobacco products but it failed to bring down the smoking habits. Initially it was the idea that both buyer and seller will bear the tax burden. But in many cases it was seen that the entire tax burden was passed on to the consumers. However the revenue collected form taxes can be used in social purposes. Then it will be more meaningful.

**Coase Theorem :** Ronald Coase (1960) argued negative externalities is a matter of property rights. If transaction cost is negligible, the market is under perfect competition and the government clearly assigned the defined property rights to private parties who are affected by externalities or generate it will voluntarily negotiate among themselves and optimal resource allocation to the society will be reached irrespective of the property rights are assigned. That means if a person has the right of the air where he lives ,he can negotiate with the promoter of the factory on about the emission and social balance will be reached. The factory promoters can pay the others. Organised payments can be done for their action and problem can be solved without government intervention.

Ans (b)

### **Case study-Agricultural ground level water scarcity in India**

The study selected India as the base country for the case study. The case study is based on agriculture sector. Though agriculture in is basically dependent on the rain water and it is monsoon based economy but irrigation also play a major role in agricultural production. For last three decades, the ground water is the major source of irrigation growth. According to Gandhi & Namboodiri (2009) 70% of all food grain production comes form irrigated land in India and 60% water of all irrigation comes from ground water. With the help of wells, tube wells water channels and deep tube wells irrigation is done. The water resource and the ground water table is suffering from the over exploitation of water for irrigation. The ground water resource has become scare in India now.

**Negative externality:** Lack of water resource and the poor environment due to it is considered as the negative externalities in the agricultural production market. Though initially agricultural production got improved because of irrigation but over usage of it made the natural resource scare. The numbers of irrigation blocks which are considered as overexploited are growing at a shocking rate of 5.5 % per annum. That is why physical scarcity of water has become negative externality (Rosegrant, 1995). Physical scarcity of water due to depletion and degradation of resources of water will causes negative impact on production, productivity and profits in the agriculture sector. However, amidst admitting the huge significance of groundwater irrigation, it can be said that the water situation is heading for a crisis in India. It needs an urgent understanding and consideration.

**Agricultural market characteristics:** agricultural production market in India cannot be perfectly categorised under any kind of market such as perfect competition, monopoly, monopolistic market, oligopolistic market. But the market characteristics are very close to perfect competition. A number of assumptions of ideal perfect competition market have to be

compromised to put agricultural farming market under perfect competition category. The perfect competition market assumes that a vast number of buyers and sellers are present in the market (Velupillai, 2009). This assumption holds true because in India market is highly fragmented and huge and participants are innumerable. It also assumes that the producers are similar size and capacity. It does not hold true for a country like India. Cause the capacity and size of farmers are diverse. There are farmers who are extremely poor and highly marginalised. Suicides of debt trapped farmers are not uncommon in India. Simultaneously there are a number of firm house owners and land owners who are really rich. According to Binger & Hoffman (1998) another assumption about perfect competition market says that no one should be price maker but the price taker. But in India there are many agricultural business houses and hoarders who enjoy a higher bargaining power compared to others. So some are price maker and others are price taker. Though the government of India has decided minimum support price for many agricultural items but in number of cases it has been seen that many farmers are not able to get that. Another important assumption of perfect competition is smooth flow of information related to the market. Here it also does not hold true because information blockage and manipulation of information and price are there. However after examining the characteristics it can be said that agricultural production market is quite to perfect competition.

### Ground water situation in India

The way ground water is exploited in India is much more than the way new ground water is developed. Annually 43.57 million hectare-meters is the total replenishable groundwater resource in India. The figure is very low compared to the demand or requirement for the country like India.

Table -1: Ground Water Resources of India, (in Million Hectare-Meters per Year)

1. Total Replenishable Ground Water Resources	43.57
2. Provision for Domestic, Industrial and Other Uses	7.15
3. Available Ground Water Resources for Irrigation in Net Terms	36.42
4. (3) as percent of (1)	83.56
5. Utilizable Ground Water Resources for Irrigation in Net Terms	32.77
6. Gross Draft Estimated on prorata basis	19.29
7. Net Draft	13.5
8. Balance Ground Water Resources for future use in net terms	22.89
9. Level of Ground Water Development	37.08

Source: India, Central Ground Water Board 2003.

Table -2: Distribution of water source According to Ownership (%)

	Dug wells	Shallow tube wells	Deep tube wells	Total	Surface flow
Government	1.79	0.57	9.49	1.46	41.24
Cooperative Societies	0.1	0.09	0.36	0.1	0.38

Panchayat	0.15	0.23	0.66	0.2	7.11
Group of Farmers	16.76	4.01	27.64	11.31	15.29
Individual Farmers	80.94	94.57	0	84.78	33.8
Others	0.26	0.54	61.86	2.15	2.17
Total	100	100	100	100	100

Source: India, Ministry of Water Resources 2002

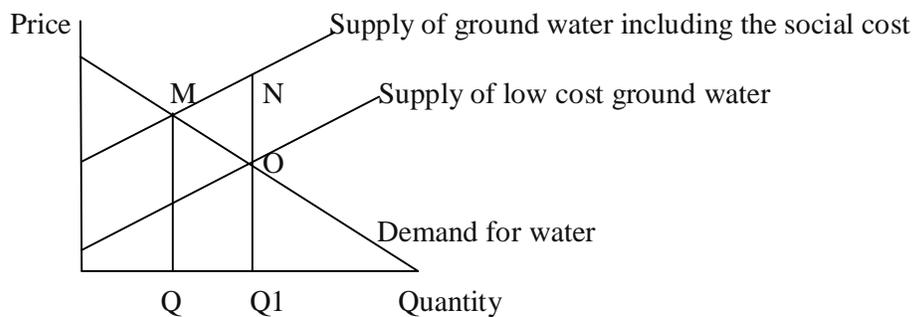
From the above chart it is clear that most of the ownerships of the water sources are private and individual.

**Implication of the over extraction of groundwater:** According to Hardin (1968) the ground water is suffering from tragedy of commons. In the informal market all the participants want to maximise their profit and exploit the ground water. Thus nobody gets any advantage and the society bear the cost of over exploitation.

The wells are shrinking continuously and fast. It will take enormous toll from private, public and environmental. The way India is going to manage its groundwater resource in the coming days will undoubtedly cast very serious impact on the future growth and development in the agriculture sector in India. Not only that the alleviation of poverty in India is also dependent on the irrigation scenario.

### Deadweight loss

Chart-2: Deadweight loss due to negative externalities in agricultural ground water



According to the chart -2 the demand curve shows the demand for irrigable ground water. The lower supply curve is denoting the supply of ground water with only private cost. The upper supply curve is denoting the supply of ground water including the social cost. Now the farmers are getting Q1 amount of water. As they are not paying the social cost of water scarcity the society is incurring the social welfare deadweight loss. The area is marked by MNO.

Some statistics about the Indian water scenario can clear the picture. According to Asian development bank, in terms of per capita water availability the country is moving towards danger zone. Half of the country's population lack safe drinking water. About 22 out of 30 cities in India face severe water crisis.

**The government initiative:** the government is basically following the legal method such as command and control on the procedure. Researchers admitted that in a big country like India, especially in rural India it is very difficult to any law in command and control basis. Venkatachalam, (2004) argued that the irrigation of water is influenced by many factors such as social, political, economic, geographical and region specific issues. That is why the government policies fail to predict the mind set of water users and ultimately fails to achieve the expected goals.

Apart from this several provisioning measures have been taken to restore the water resource such as rain water harvesting, watershed program and rejuvenation water bodies etcetera. Though these initiatives have been taken but it has not been implemented in a large scale. That is why the water rejuvenation is quite inadequate compared to the requirement.

**Role of the farmers:** the development of ground water irrigation cannot be largely attributed to the government policy. Rather it took place gradually with the help of highly decentralised private farmers. Farmers who are extensively using the natural resource, water are either ignorant or unaware about the result of it. The entire society and the entire country including both rural and urban India are suffering from deep water crisis. As no big investment is coming from the end of the water users, the farmers or from the government the water scarcity problem also suffer from lack of finance. That is why, according to Saleth &Dinar (2004) financial scarcity is considered as the prime cause for negative externalities about water in the agriculture sector. As no capital is formed the problem remains unsolved.

(c)

The government policies have failed to address the problem. As the demand for water in continuously increasing, the command and control system does not work here effectively. The study concluded that following the Coase theorem it is a matter of property right issue.

As an alternative suggestions, market based mechanism can work in the situation. Thobani (1997) argued that under the tradable water right regime the water production will automatically adjust the scarcity. A research done by Biswas (2008) reveals that farmers in the Malaprabha river basin in Karnataka, India, are willing to pay for water much more than the existing government fixed water rates, provided they are supplied if they get reliable water for irrigation from any other alternative institutional arrangements. These kinds of findings encouraged the study to recommend market mechanism. Economists like Thobani (1998) highlighted that in a formal mechanised market there will be willing buyer to pay and willing seller to accept to maximise their own benefit. Then that will solve the problem of scarcity of water. Backeberg, (2005) also empirically proved that is such situation market mechanism can work efficiently. It is already said that the market is similar to perfectly competitive market. However there are some difficulties in measuring transaction cost because information is highly asymmetrical better flow of information will lead to an efficient equilibrium.

Though there are many advantages of market mechanism but there are many disadvantages as well. One of its limitations is that it does not make sure that no one gets deprived. At least in the current system there are some norms on distribution but in market mechanism it is open to all. For instance, if any imperfection enters in the market such as corruption, coercion, manipulation, undue influence etc, the market may not work efficiently. Currently there some command and control over the supply of ground water usage and distribution. But if the

government withdraws its control then one cannot ensure that rules and regulations are maintained properly.

Conclusion:

Negative externalities in the economy occur when the economy does not choose to incur the cost but gets it. Pollution is an example of negative externalities. Producers only produce at the private cost but the entire society bears the cost for pollution and its negative impacts. Here the marginal social cost is more than the marginal private cost. So a social welfare deadweight loss takes place for the society.

A case study related to the negative externality in economy based in India is given here. It showed that the ground water level is falling due to the over usage of ground water for irrigation purpose. The entire country is suffering for water crisis in bad way. The government of India tried to address the problem by using command and control method. It also took up provisioning such as rainwater harvesting and other projects. However it was seen that these projects were not adequate and successful. The study suggested that market mechanism might prove successful if the property right is ensured.

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