

# **Policy Instruments for the Protection of Environment**

The basic life support system of the planet i.e. air, water, soil and vegetation is being destroyed due to the activity of mankind.

More than 80 % of the poor households in developing countries does not have water connections and facing the problem of water pollution. In the same way 2.7 million people die due to air pollution each year.

There is 1.5 billion hectares of land degradation due to soil erosion in developing countries each year which ruins the life and livelihood of the poor people in these countries.

A path of economic growth that causes unchecked damage to the environment is neither desired nor considered to be sustainable by most governments.

Thus, most countries in an effort to address the problems, have set up some form of environmental policy attending to their specific circumstances and needs.

## **Policy Instruments**

The success of any environmental policy depends on the behavior of producers and consumers.

The environmental authorities may try to bring about change by means of various instruments.

These instruments can be classified into three broad categories.

They are:

1. Communicative /Persuasive Instrument
2. Direct Regulation/ Command and Control
3. Economic Instruments

## **.Communicative Instruments;**

Instruments aimed at voluntary adaptations of individual and group behaviour in a more environment friendly direction come under this category. This category includes:

-The *provision of knowledge and information* in all possible forms, *both on the environmental effects of the present behaviour and on cleaner alternatives.*

-*Moral persuasion*: Campaign to persuade people and institutions to change their behaviour

*Institutionalization* of environmental management within firms and other organizations.

*Voluntary commitments* by traders and industrialists or agreements between them and the government implying certain environmental targets to be realized

**b. Direct Regulation/Command and Control:**

Those instruments which influence the range of alternatives by means of *prohibitions, restrictions* or *obligations* are called direct regulation. Such instruments have a *command and control* character.

The instruments can be applied through introducing *product, process* or *emission standards*, by

- *prescribing performance pattern of certain activities,*
  - *specifying the precautionary measures to be taken,* etc.
- Outright ban on certain activities, products or substances also belongs to this category. Bans may be limited in space and time.

These Instruments (Command and Control) are very useful in certain specific cases :

- for activities with serious impacts on health
- for situations which have to be solved in a very short period of time
- in situations where the non-attainment of environmental targets would result in large risks or very uncertain situations (e.g. storage of nuclear waste)

### **c. Economic Instruments**

Any instrument that aims to induce a change in the behaviour of economic agents by internalizing environmental or depletion cost through a change in the incentive structure that these agents face qualifies as an economic instrument.

Economic instrument provide economic incentives to economic actors inducing them to behave in an environmentally more appropriate way.

Economic instruments aim to bridge the gap between private and social costs by internalizing all external costs (both depletion and pollution costs) to their sources.

*The history of economic Instrument goes back to 1920*

In 1920 Pigou discussed about externalities and suggested for tax to negative externalities and subsidies for positive externalities.

Though he did not discussed about the global environmental problems the concept of Pigou is equally important in our present day situation.

OECD during 1970's developed the concept of PPP

IUCN during 1980's

UNCED in 1992 Principle 16 -use of economic instrument for sustainable development

The main objectives of the use of economic instruments are:

- a) Change in behaviour by offering incentives.
- b) Internalize external costs (both resource depletion and pollution costs),
- c Shifting of the burden of proof to the polluter
- d Generate revenue to finance monitoring and enforcement cost of pollution control.
- e Develop cost effective technologies to reduce pollution.

These instruments provide incentive for research and development of cost effective technologies.

## **Types of Economic Instruments:**

Economists classified economic instruments into six broad categories on the basis of actual or proposed practice in different countries of the world. They are:

- a) Property rights
- b) Market Creation
- c) Fiscal Instruments
- d) Charge System
- e) Liability system
- f) Deposit refund system

## a) **Property Rights**

This class of instruments is based on the recognition that excessive resource depletion and environmental degradation arises from misleading price signals, which result from the absence of markets in resource and environmental assets. The failure of markets is due to the lack of well-defined, secure and transferable property rights over resources. With exclusive and secure property rights, resource depletion is internal to the owners/users. Consequently, the owner will not engage in resource extraction unless the price of the resource-commodity covers not only the extraction cost but also the depletion or user cost, which is the foregone benefit as a result of present use.

There are certain limitations on the use of property rights. It can also be used to achieve political objectives by rewarding political supporters and it may create distributional effect. Caution must be mentioned while providing property rights. It will be better to provide property rights to the community or groups rather than individual

## **b) Market Creation/Tradable Permit System**

Property rights are appropriate for the protection of natural resources but are not feasible for the prevention and control of pollution in air, water and atmosphere. An alternative cost effective approach is to create a market in environmental quality. According to this approach, the scarce environment is overused being a free good.

A solution thus, might be to create a market in which the right to use the environment as a waste sink is assigned price and traded. Market will be created by giving the permits. The permits can be sold or auctioned with proper price or it may be allocated to general public with different proportion to different group. Such selling or distribution to public may minimize the distributional effect.

### **c) Fiscal Instruments**

Fiscal instruments such as *taxes and subsidies* could be used to bridge the gap between private and social cost/benefits. Environmental taxes can be used to effect full cost pricing..

Emission and effluent taxes can be structured in such a way as to provide a progressive incentive for pollution control.

Taxes can also be levied on inputs or final products which are associated with pollution externalities.

Taxes on fuels, industrial chemicals and pesticides come under this category.

Such taxes induce reduction in the use of these products and proportional reduction in the production of pollutants.

Polluters who meet more than the set effluent standard could be charged lower rate while those who violate the standards would be charged higher rate.

*Subsidies* also comes under the fiscal instruments. Polluters can be subsidized to reduce the pollution.

In the long run, subsidies may induce new entrants into the industry and result in increase in pollution and cost of subsidy.

Subsidies are not compatible with polluter pays principle, since the burden of subsidy goes to tax payer.

It also do not induce the polluter to develop of pollution abatement technology.

However, in some cases subsidies may affect positively. e.g. incentive for the collection of recyclable plastics, segregation of waste at the household level etc.

## d) Charge Systems

Charges are payments for the use of resources, infrastructure and services and are similar to market prices for private goods. Charges aims to cover cost for a specific public investment to finance the long run marginal cost of supply.

. Thus *user charges* are instruments for reducing wasteful use, managing demand and including conservation. They are also for the recovering of cost or financing of supply expansion.

In the same way, *pollution charges* are instruments for internalizing external costs and encouraging pollution control and are also a means for raising revenues to finance environmental investments.

## **e) Liability System**

Some instruments are specially intended to ensure compliance. Such instruments like criminal penalties, fines, liability and performance bond come under this category . This class of instrument aims to induce socially responsible behaviour by establishing legal liability for

(a) natural resource damage

(b) environmental damage

(c) property damage

(d) damage on human health or loss of life

(e) non compliance to environmental laws and regulations and

(f) non-payment of due taxes, fees or charges.

## **g) Performance Bonds and Deposit Refund Schemes**

Environmental performance bonds and deposit refund systems are economic instruments that aim to shift responsibility for controlling pollution, monitoring and enforcement to individual producers and consumers who are charged in advance for the potential damage.

It requires consumers to pay a surcharge when purchasing a potentially polluting product to encourage recycling and, thereby, prevent environmental damage.

The deposit is returned after the product has been consumed or used and returned to an approved location for recycling or reuse.

Such environmental bonds ensure that

(a) resource extracting companies and potential polluters take adequate measures to minimize the environmental damage caused by their activities;

(b) they effect cleanup and restoration of residual damage in the most efficient manner and

(c) adequate funds are available for the cleanup of waste and restoration of damaged environments by anyone who fails to comply.

Such schemes are useful for beverage container, batteries, oil, tyres, pesticide containers and old electronic appliances. May also be useful for milk pouch

## **Basic Criteria for Selection of Policy Instruments**

All instruments are not equally suitable for all conditions or situations.. The suitability of a particular type of instrument depends upon the specific circumstances.

There are mainly eight criteria for the selection of policy instruments

a. **Environmental Effectiveness**

The main purpose of the environmental policy instruments is to achieve certain environmental goals or targets.

An instrument which is not effective in reaching its target does not perform well, irrespective of its performance with respect to other criteria.

Effectiveness depends upon the compliance of polluting agents.

A set of measures which has been effective in one set of circumstances is not necessarily effective in another.

Instruments should therefore be able to adjust to changing economic and environmental circumstances.

b. **Economic Efficiency**

Environmental policy instruments should attain environmental targets at least (social) costs.

Inefficient approaches to pollution control waste scarce resources which could be used in other ways to generate higher level of environmental quality or to provide other goods and services.

### **c. Equity**

Environmental policy instruments affect the distribution of income and wealth. In a way, they are meant to do so.

Traditional rights (to pollute or to use up resources) are taken away from one group of actors and are transformed to other actors (at home or abroad or present or future). While framing the instruments such impact should be clearly analyzed.

The concept of equity is also applicable in many multinational conventions for the global environmental problems. Framework Convention on Climate Change and Convention on Biological Diversity has recognized the common but differentiated responsibility as a means for adopting the principle of equity.

#### **d. Administrative Feasibility**

One of the preconditions to the effectiveness of policy instrument is that they are enforceable at reasonable costs. Efficiency requires that the total costs of adjustment, implementation, enforcement and administration are minimized

#### **e. Acceptability**

The instrument should be acceptable to all concerned. Acceptability of the instruments can be increased by timely information on specific features of the instrument to target group, consultation with the target group in the execution of instrument and by progressive implementation

## **f. Flexibility**

The instruments must be flexible enough to adjust to changes in technology, resource scarcity and market conditions.

## **g. Dynamic efficiency**

The instrument should provide incentives for developing and adopting new environmentally cleaner and economically more efficient technologies.

## **h. Ease of Introduction as well as Monitoring and Enforcement**

The instrument should be consistent with the country's legislative framework and administrative capability. The instrument should also be easy and less costly to monitor and enforce.

<b>Solution</b>	<b>Internalize external cost</b>	<b>Innovation</b>	<b>administrative cost</b>	<b>Increase gov. Rev</b>	<b>International competitiveness</b>
Regulation	partially	can encourage	high	no	Decreased
Subsidies	no	can encourage	low	no	Increased
Withdrawing harmful subsidies	Yes	can encourage	low	yes	Decreased
Tradable rights	yes	encourages	low	yes	Decreased
Green taxes	yes	encourages	low	yes	Decreased
User fees	Yes	can encourages	low	yes	Decreased
Pollution prevention bond	yes	encourages	low	No	Decreased

## **Distributive Effects of Environmental Policy**

We know that any program to improve the quality of environment should satisfy among others-

two important criteria- equity and efficiency.

The success of any environmental program depends on the mechanism of sharing of costs and benefits.. All the environmental programs are prepared to increase the welfare of the people. In such situation there always arises a question of equity.

It is very difficult to measure the distributional equity.

The impact of environmental policies is not uniformly felt by the concerned people. Those who feel that they are being treated unfairly will not extend their support to the programme.

Normally the majority of the support for environmental programme comes from middle and upper income group of people as environmental quality is considered as luxurious goods.

The priorities of poorer people is different i.e. they primarily want to fulfil the basic needs like food, clothing and shelter. The poor people do not have enough savings to protect themselves from the disruptive side effects of environmental measures. Hence it is felt that when a polluting plant is shut down, the poor are victimized more because of unemployment.

The equity issue is measured in terms of cost and benefit sharing mechanisms of the society. The cost and benefits from an environmental programme vary from person to person. The distribution of these benefits and costs alters income distribution.

For example, if a firm is prohibited from dumping untreated effluents into a neighboring river and if the firm has to close down for lack of alternate disposal site than the users of the river will benefit. The cost of such measure is on the firm, the labourers who lose their job and consumers of the firm's product if no substitutes are available.

If instead the government cleans the river, than the cost are on the tax payers, who may not be the users of the river.

The equity issue may be more complex than the example stated above. If a government levies a tax on emissions of a polluting firm. This may affect not only the cost and price of the product of the firm but it may also affect the cost of other firms which require this product as input. Consequently the price of all products will increase. Hence, evaluation of the ultimate impact of a particular tax measure to control pollution is thus a complex one.

## **Classification of Costs and Benefits:**

Benefits from an environmental program may be distinguished as benefits that flow to polluted area (reduce emissions of automobiles- closure of Bikram Tempo) and benefits that flow to remote locations (Preservation of forests).

The poorer may be benefited more from the program of preservation of forests.

The cost can also be divided into two-Transition (temporary), and continuing (long run).

Transition costs- Unemployment and other disruptions of relocation of the firms that are required to move or shut down altogether. Such costs are short term and once adjustment has been made for a cleaner environment such costs disappear.

A regulation requiring the fixing of a pollution control device in automobiles will increase the regular cost of the automobiles.

In the same way if an industry requires to treat the effluent to meet certain prescribed standard its cost will increase permanently.

If an industry have to pay tax for the operation of plant such tax burden are also of permanent nature.

## **Distribution of Benefits:**

Benefits from environmental programs vary from one place to another. It is also determined by the nature of the program implemented. Normally it is believed that benefits from an air quality improvement program benefits both rich and poor equally. But evidence suggest that air quality decreases systematically with average family income.

Rich people may avoid the polluted area, they can protect themselves by using different means e.g. air conditioner, noise insulator etc. House rent may increase in the cleaner area and the poor may shift towards the polluted area. Even in case of pro-poor (slum clearance program, the cost of relocation to the poor will be very high. The rich people assign more value to the environmental quality, thus the benefit to them will be higher.

On the other hand the priorities of the poor are very different. The long term benefits from environmental program have no relevance to them. The poor people may not favour to stop using pesticides, since it may reduce the food available to them. They prefer basic food instead of protecting the soil quality or reducing the non point pollution of water.

Thus, we can conclude that the advantages from environmental programmes and measures flow primarily to high income group who assign more value to it than poor.

### *Distribution of costs:*

Distribution of costs may be analyzed with reference to transition and continuing

The geographic distribution, size of the population, industrialization, etc may effect the transition costs. If an industry has to close to achieve the environmental standard and if the city is small town whose primary source of income and employment is the same industry the transition costs will be very high on that city.

Though the effect of transition cost are uniform on all income groups the fear of unemployment and loss of income are more sever on low income group. Even if the unemployment resulting from control of production activities of a firm is temporary, it can still have serious financial and psychological effects on low income group as they don't have savings to manage the unemployed period.

Continuing costs pose a real problem of distribution. When an industry is required to install a pollution control equipment its cost will increase which will increase the price of the product it produces. On the other hand government need resources to organize environmental protection program.

Thus, the individual consumer bears the continuing costs in two forms a). in the form of tax required to generate resources for environmental agency b) in the form of increased prices due to increase in costs to install the pollution control equipment or payment in the form of fee or tax.

It is normally considered efficient since the external costs are internalized as the external costs are also included into the price of the product. As the costs are included the commodity becomes expensive which may lead to decrease in consumption of such commodity.

However, the distributive effects of such internalization of external costs depends upon who are the ultimate user of the commodity or service produced by such industry. The price rise may be considered positive if the ultimate consumer of the product are rich people. And if the poor people consume the good than the increase in price due to internalization of external costs is considered regressive.

Again the distributive effect depends upon the uses of the product produced by the polluting industry. Whether it is used as final product or intermediate product. If it is used as intermediate product a rise in price of this product may increase the price of another product for which it is used as raw materials.

As costs and prices increases wages may be reduced by reducing the production. If such case happens it may have regressive impact.

Empirical studies show that the distribution of costs for environmental program (taxes to finance government expenditure) is regressive falling more to poor income group.

In another study benefit of ambient air quality was progressive however, the cost was regressive.