

## **Policies, Instruments And The Environment**

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Having set the macro and sectoral policies, the next task is to identify the externality problem and to design policies to address them. Policy makers to induce consumers and producers to undertake a level of activity can use various instruments. The various instruments are the property rights, Command and Control regulation, Pollution charges, tradable permits, and other charge systems. Number of criteria like cost effectiveness, dynamic incentives, implementation and flexibility has to be considered while choosing among the instruments.

#### **Property Rights**

In a classic article, Ronald Coase (1960) showed that in the absence of transactions cost the social optimum would be reached (for example, the optimal level of pollution, the optimal level of trees cut of a protected level and so on) whether property rights are initially allocated to polluters or to those suffering from the pollution. This result has become known as the Coase Theorem. The Coase theorem tells us that the optimum is reached whoever is allocated the property right. But for this result to be obtained, important assumptions must be satisfied. First, it must be possible to precisely define the property right. Second, this property right must be enforceable and transferable. Third, the parties to the transactions must be well defined. Third, the parties to the transactions must be well defined. This may be particularly difficult when today's actions affect future generations; by definition, these cannot be part of current negotiation. Fourth, those owning the property rights must be able to capture all values associated with the environmental asset they own. In the forestry sector for example, this is generally a problem since the property right is typically defined solely over the wood value of the forest. Finally, the transaction costs must be small.

#### **Command and Control Regulation**

The traditional approach to environmental protection has often relied on command and control instruments. The regulator commands a desired behaviour, typically by imposing a limit on the amount of emissions that a polluter can produce. These limits are generally called emission standards. The regulator then controls and enforces compliance with the chosen standard. Under this regime, the incentive for pollution control take the form of penalties or sanctions that the polluter is faced with if they do not comply with the command. The granting or withholding of permits, licenses, or other authorizations is another important tool for controlling pollution. The permits or licenses are tied to an air or water quality standard and may be subject to the fulfillment of specific conditions such as compliance with a code of practice, minimization of environmental and economic impacts, installation of treatment plants.

The command and control approach potentially gives the regulator maximum authority to control where and how resources will be spent to achieve environmental objectives. Under ideal conditions, the regulator would be able to identify precisely the marginal abatement cost and marginal damage functions characterizing each and every polluter and would impose a ceiling on emissions. The biggest advantage of this methodology is that it provides the regulator a reasonable degree of predictability about how much pollution levels will be reduced. The problem with this methodology is that this approach is ineffective and insufficient in addressing many of the recent pollution control and waste management problems confronting environment managers, such as non-point source pollution, like urban and agricultural run-off, solid waste disposal, global environmental problems like ozone depletion and climate change.

#### **Pollution Charges**

The principle supporting the use of this is that a charge per unit of pollution is relatively simple. Consumers and producers base their decisions on private costs and benefits as opposed to social costs and benefits. The principle behind pollution charges and tradable emissions permits is to create a price equivalent to these external costs. The level of charge, which equates the marginal abatement cost and the marginal damage functions, is referred as Pigouvian tax. In reality, however the regulator does not know the firm specific marginal abatement cost and marginal damage functions. As a result, the pollution charges tend to be uniform.

#### **Tradable Permits**

This is a scenario where the actors can buy 'rights' for producing pollution or they can sell these

'rights' to other actors. Under a marketable/tradable permit system, the responsible authority determines a target level of environmental quality defined as an allowable level of emissions or an ambient environmental quality standard. This is then translated into a total number of allowable emissions that can be discharged. Discharge rights are then allocated to firms in form of permits and the owner is allowed to discharge a specific amount of pollution. This may also be transferred from one source to another. One major problem with this approach is that knowing the nature of the process into which the regulator is engaged, firms are going to adjust their emissions in a strategic manner. Another issue here is trading between pollutants whose emissions have very different environmental impacts.

### Deposit Refund Systems

In this system the potential injurers are subjected to a tax (deposit) in the amount of the potential damage and receive a subsidy (refund) equally large in terms of present value, if certain conditions are met, for example, proof that a product is returned to a specified place or that a specified type of damage has not occurred.

### Input Tax/Charge

An input tax is a tax on water consumption or a tax on the quantity of energy used or a tax on any input whose use generates pollution. It is easier to measure and monitor than a direct tax on pollution. Along with input tax, exemptions may be given to firms with clean technologies and rebates may be given to plants, which undertake pollution abatement. A gasoline tax is a good instrument for dealing with environment problems related to the burning of gasoline, such as the emission of air pollutants. This tax can provide significant energy-security benefits by reducing a country's demand for the import of crude oil. Almost all European Countries have fuel taxes. The tax rates vary depending on pollution generating characteristics of different fuels. Taxes minerals, water and other scarce inputs can encourage conservation.

### Performance Bond

A production oriented deposit refund system is known as performance bond. The potential entrant in this activity has to deposit an amount equal to the expected restoration costs and the deposit would be refunded when the site is restored in such a way as to meet environmental standards. This scheme is applicable to new chemicals whose environmental effects are known. The producers of the new chemical bear the cost of risk.

### Strict liability for pollution

Liability as a policy instrument for damages is recognized in common law. This scheme holds promise in situations where information about potential damage is scarce, the discharges are stochastic, monitoring is difficult and the polluter has financial capability to pay the necessary compensation in the event of damage. As the imposition of such liability shifts the cost of risk to the polluter, he has an incentive to engage in preventive measures. Like a Pigouvian tax, strict liability internalizes the external costs.

### Other Charge Systems

**User Charges** are direct payments for the costs of collective or public treatment of pollution. They are used most often in the collection and treatment of municipal solid waste and for the discharge of wastewaters.

**Product Charges** are fees added to the price of the products or product inputs that cause pollution in either the manufacturing or consumption phase or for which a special disposal system has been established. They are similar to effluent and emission charges.

**Administrative Charges** are fees paid to authorities for services like chemical registration or the implementation and enforcement of environmental regulations. They are a component of direct regulation and are intended primarily to finance the licensing and control activities of pollution authorities.

**Tax Differentiation** is used to promote consumption of products that are environmentally safe. This instrument involves a positive charge on a polluting product and a negative charge, or subsidy on a cleaner alternative. It is used mainly in the context of transport to discourage consumer purchases of polluting vehicles or fuels.