SEMESTER 4 – ENVIRONMENTAL ECONOMICS

MODULE 1:

Objective standard based valuation

The following methods are used for Objective Standard based environmental valuation:

(A) Expressed Preference Methods:

The demand for environmental goods can be measured by examining individuals' expressed preference for these goods relative to their demand for other goods and services. These techniques avoid the need to find a complementary good (travel or house), or a substitute good (compensating wage rate), to derive a demand curve and hence estimate how much an individual implicitly values an environmental good. Moreover, expressed preference techniques ask individuals explicitly how much they value an environmental good.

Contingent Valuation Method (CVM):

Analytic survey techniques rely on hypothetical situations to place a monetary value on goods or services. Most survey-based techniques are examples of contingent valuation method. Contingent valuation frequently elicits information on willingness to pay or willingness to accept compensation for an increase or decrease in some usually non-marketed goods or services.

Trade-Off Game Method:

This method relates to a set of contingent valuation techniques that rely on the creation of a hypothetical market for some good or service. In a single -bid game the respondents are asked to give a single bid equal to their willingness to pay or willingness to accept compensation for the environmental good or service described. In an iterative (repeating) bid game the respondents are given a variety of bids to determine at what price they are indifferent between receiving (or paying) the bid or receiving (or losing) the environmental good at issue.

Costless-Choice Method:

The costless-choice method is a contingent valuation technique whereby people are asked to choose between several hypothetical bundles of goods to determine their implicit valuation.

COMMON PROPERTY RIGHTS

Common property is defined to be any renewable natural resource unit needing management under Common Property Rights to be sustainable. Everything else is treated as ***private property***. Many units of renewable natural resources, like forests, water sources, fish farms, and farm fields, may be managed sustainably as private property under existing property law, as for example by collective management regimes, government programs, corporations, or farmers. Common property thus refers to *managerial* rather than *physical* characteristics. Common property typically includes the air we breathe, the rivers we share, the oceans, and so on.

Common Property Rights is a new approach to the legal right to manage, but not own, the health of an ecosystem service whose wise stewardship would benefit the common good.

The diagram shows how Common Property Rights is the mirror image of Private Property Rights. **Click on it to hide or show the butterfly**. The butterfly represents the symmetry of the system and the importance of the Shared Infrastructure System, which is much like the body of the butterfly.

The Common Property Rights system manages common property, like the air we breathe and the water we drink. The Private Property Rights system manages private property. Common Property Rights uses non-profit stewardship corporations called stewards, while Private Property Rights uses for-profit corporations. Stewards charge fees for ecosystem service use, while corporations charge prices for products and services. And so on.

A funny thing happened a long time ago. We forgot to invent Common Property Rights! All we invented was Private Property Rights.

Ever since then, the human system has been like a butterfly with one wing. It's imbalanced. The world's Private Property Rights has brought unimaginable benefits, which exploded with the Industrial Revolution. But that's come at a steep price. It's unsustainable because the butterfly is missing the wing of a Common Property Rights system. That system would be as universal, generic, and efficient as the world's already existing Private Property Rights system.

Energy Flow

The chemical energy of food is the main source of energy required by all living organisms. This energy is transmitted to different tropic levels along the food chain. This energy flow is based on two different laws of thermodynamics:

- First law of thermodynamics, that states that energy can neither be created nor destroyed, it can only change from one form to another.
- Second law of thermodynamics, that states that as energy is transferred more and more of it is wasted.

Energy Flow in Ecosystem:

The energy flow in the ecosystem is one of the major factors that support the survival of such a great number of organisms. For almost all organisms on earth, the primary source of energy is solar energy. It is amusing to find that we receive less than 50 per cent of the sun's effective radiation on earth. When we say effective radiation, we mean the radiation, which can be used by plants to carry out photosynthesis.

Most of the sun's radiation that falls on the earth is usually reflected back into space by the earth's atmosphere. This effective radiation is termed as the Photo synthetically Active Radiation (PAR).

Overall, we receive about 40 to 50 percent of the energy having Photo synthetically Active Radiation and only around 2-10 percent of it is used by plants for the process of photosynthesis. Thus, this percent of PAR supports the entire world as plants are the producers in the ecosystem and all the other organisms are either directly or indirectly dependent on them for their survival.

The energy flow takes place via the food chain and food web. During the process of energy flow in the ecosystem, plants being the producers absorb sunlight with the help of the chloroplasts and a part of it is transformed into chemical energy in the process of photosynthesis.

This energy is stored in various organic products in the plants and passed on to the primary consumers in the food chain when the herbivores consume (primary consumers) the plants.

MODULE 2:

COASE'S BARGAINING SOLUTION AND COLLECTIVE ACTION

Ronald Coase's "The Problem of Social Cost" is not only one of the most cited articles in economics, law and social science, but also one of the most debated works in these fields. Hardly any other paper has been subject to either the ardent support or the severe criticism Coase's piece has received in hundreds of studies. Researchers have identified and discussed multiple aspects and layers of the article's content, e.g. four theorems and four corollaries. Scholars have explored the impact of transaction costs on the assignment of property rights and the implications of the latter for institutional structures, natural resource management, pollution, and many other aspects of social life.

In fact, Coase himself mentions in his article (but without going into much detail) the issue with multiple consumers of externalities. He notes that when "a large number of people are involved", arrangements made by central governance may be more efficient than those handled through the market. Whereas Coase acknowledges the *possible* role of the government in solving externality issues in such cases, in this paper I argue that when multiple co-owners of a common resource are involved, any Coasean solution *unavoidably* employs centralized interventions (although generally at levels lower than the government) that should be termed Pigovian. If, for instance, as a result of Coasean negotiations a collective company-polluter has to compensate a victim of pollution, then the only way for the company's management to raise the funds for the payment is by imposing a sort of "Pigovian tax" on all shareholders. Or if the victim to be compensated is a local community, the body governing this community will allocate the compensation among the community's members through a sort of "Pigovian subsidy".

If not for the title of Coase's article, considering the multiple-parties option might seem unimportant. Yet the title is about social cost, because this is characteristic of externalities: they generally concern multiple parties. It is therefore strange that in his article Coase investigates only costs incurred by single third parties. In the Pigovian sense, "social cost" is a cost incurred by society, which clearly comprises multiple third parties. As this research concludes, when several or numerous third parties are concerned, the Coasean and Pigovian approaches are neither totally different nor opposite to one another, but rather are complementary. After all, Pigovian regulation and taxes/subsidies.

GLOBAL ENVIRONMENTAL EXTERNALITIES AND CLIMATIC CHANGE

Much discussion of the economics of global warming emphasizes the issue of trade-offs in well-being between present and future generations. Specifically, is it socially beneficial for present and near future generations to sacrifice their own consumption to mitigate global warming for the benefit of generations yet to come? In this paper we argue that the intergenerational distribution aspects of climate policy are relevant only when the externality has been corrected, and concern the distribution of welfare gains, not costs.

If global warming is a negative externality, standard welfare analysis shows that all generations can benefit from its mitigation. Current generations can direct less of their foregone consumption to physical capital formation and more toward mitigation, thereby maintaining their own levels of welfare while bequeathing a better mix of conventional capital and stock of greenhouse gases (GHG) in the atmosphere to the future. We illustrate this point by solving a business as usual economic growth model calibrated to current data for the intertemporal allocation of capital by a representative agent with an uncorrected externality and comparing the results to a solution in which the externality is corrected. The results show that the correction can represent a Pareto improvement from an inefficient to an efficient growth path with higher consumption levels and lower environmental damage.

There are world political efforts to implement institutions which enforce the social cost of carbon emissions on individual agents, most notably the Kyoto Protocol which created a carbon market and is international law since 2005. Our contribution provides theoretical justification for such and further measures; the existing framework only succeeds in partially internalizing the externality with the emissions restrictions set in generous manners and the majority of emissions not being subject to any caps.

The Global Warming Problem Human (industrial) production entails emissions of GHG. Given scientific evidence like the results presented in the 4th report of the Intergovernmental Panel on Climate Change (IPCC), such emissions impact the world climate negatively. An increase in the concentration of GHG is projected to increase the mean atmospheric temperature implying a higher frequency of disasters and natural catastrophes (such as droughts, floods, and heat waves), higher mortality rates, and a significant.

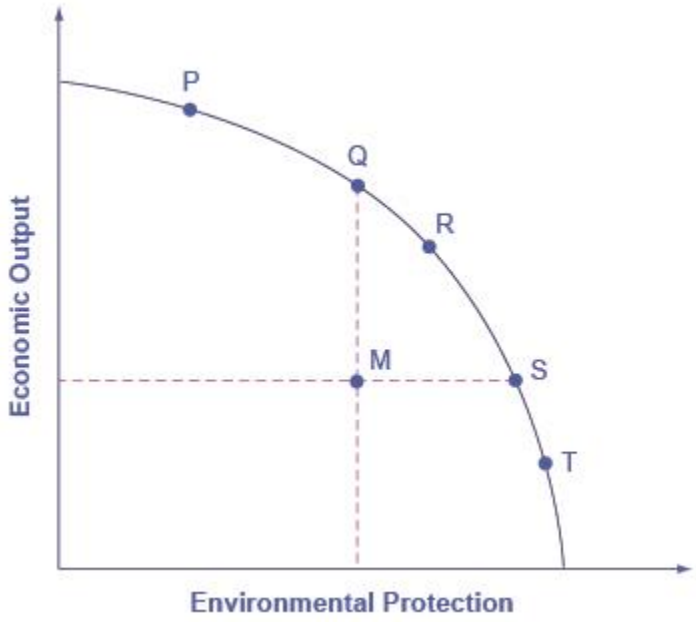
MODULE 3:

Environment and development trade off

We can analyze the trade off between economic output and the environment with a production possibility frontier (PPF) such as the one. At one extreme, at a choice like P, a country would be selecting a high level of economic output but very little environmental protection. At the other extreme, at a choice like T, a country would be selecting a high level of environmental protection but little economic output. According to the graph, an increase in environmental protection involves an opportunity cost of less economic output. No matter what their preferences, all societies should wish to avoid choices like M, which are productively inefficient. Efficiency requires that the choice should be on the production possibility frontier.

The Trade off between Economic Output and Environmental Protection:

Each society will have to weigh its own values and decide whether it prefers a choice like P with more economic output and less environmental protection, or a choice like T with more environmental protection and less economic output.



Economists do not have a great deal to say about the choice between P, Q, R, S and T all of which lie along the production possibility frontier. Countries with low per capita gross domestic product (GDP), such as China, place a greater emphasis on economic output—which in turn helps to produce nutrition, shelter, health, education, and desirable consumer goods. Countries with higher income levels, where a greater share of people have access.

THE CONCEPT OF SUSTAINABLE DEVELOPMENT

The term development is generally used to denote growth or progress. However the term, particularly in last two centuries, has become synonym to economic growth in terms of gross domestic product or the per capita income of the nation. This definition has created a rat race amongst the nations to attain and retain development goals. These goals are often contradictory to the idea of preservation or sustenance of environment. In order to re-build the harmonious relationship between man and nature, world organizations like UN, has began the campaign to have a sustainable development.

The Concept of Sustainable Development:

The most frequently used definition of Sustainable development is from the Brundtland Report "Sustainable development is the development that meets the needs of the present (people) without compromising the ability of future generation to meet their own needs". In other words it is improving the quality of life of the present generation without excessive use or abuse of natural resources, so that they can be preserved for the next generation. The term was first coined in 1972 at the United Nations Conference on Human Environment at Stockholm. The most important piece of writing on Sustainable development is in the publication by the World Commission on Environment and Development (WCED) in 1987 titled „Our Common Future". In 1992 at the Earth summit at Rio-de-Janerio, 170 countries signed many important documents on sustainable development pledging preservation of environment.

Sustainable development is often referred as the marriage of economy and ecology. i.e. to attain economic development without compromising the ecological balance. It can be attained by rigorous 215 policy change, taking action and altering practices.

There are three aims of sustainable development:-

a) Economic- to attain balanced growth

b) Ecological- to preserve the eco system

c) Social-guarantying equal access to resources to all human communities.

MODULE 4:

People's participation in the management of common and forest lands

The concept of participation originally grew out of a radical criticism of the mainstream development projects in the 1960s and 1970s. Critics asked why development projects often did not lead to the expected results and came to the conclusion that lack of people's participation was the problem. Too many projects, it was argued, were designed and implemented without debate and co-operation with people whose lives were affected by the projects. Since then, participation has become one of the buzz words of development jargon.

1.Participation is a process in which information on a planned project is made available to the public. This type of participation often involves only community leaders. These people are listened to but the decision-making power rests with the outside planners and project implementers.

2. Participation includes project-related activities rather than mere information flow. This might involve labour from a community or a longer-term commitment by local groups to maintain services or facilities or even to plan for their future use. However, people are involved but not in control.

3. Participation means that a project is a direct outcome of people's own initiatives. A famous example of this is the Chipko movement, which began in the Himalayas in the 1970s when women mobilised themselves to protect the trees that were vital to their economy (Shiva 1988).

Joint Forest Management in India:

In India, about half of the states have endorsed a strategy of joint forest management (JFM) in which forestry departments and communities jointly manage forests and share responsibilities and user rights. The idea of JFM originated from the management of sal (Shorea robusta) forests in West Bengal. The community involvement had a remarkable effect on the rehabilitation of degraded sal forests. Landsat images showed that the closed forest cover increased from 11 to 20 percent in Midnapore District alone and many square kilometres of degraded scrub forest has been upgraded to open forest category.

FORESTRY POLICY

India is one of the few countries which have a forest policy since 1894. The policy was revised in 1952 and again in 1988. The main plank of the revised forest policy of 1988 is protection, conservation and development of forests.

Its aims are:

1. Maintenance of environmental stability" through preservation and restoration of ecological balance;

2.Conservation of natural heritage;

3. Checking soil erosion and denudation in catchment areas of rivers, lakes and reservoirs;

4. Checking extension of sand dunes in desert areas of Rajasthan and along coastal tracts;

5. Substantially increasing forest/tree cover through massive forestation and social forestry programmes; 6. Taking steps to meet requirements of fuel, wood, fodder, minor forest produce, soil and timber of rural and tribal populations; 7. Increasing productivity of forests to meet the national needs; 8. Encouraging efficient utilisation of forest produce and optimum substitution of wood; and

9. Taking steps to create massive people's movement with involvement of women to achieve the objectives and minimise pressure on existing forests.

The Planning Commission suggested renaming the scheme as 'Intensification of Forest Management' during the 11th Five Year Plan. It is proposed to broad-base the scheme by including following two new components in addition to the existing components of IFPS, i.e., infrastructure development and forest fire control management.

Forest Conservation Act:

To check indiscriminate deforestation and diversion of forest land for industrial or construction work the Forest Conservation Act was enacted in 1980. The Act was amended in 1988 to further facilitate prevention of forest destruction.

The basic objective of the Act is to put a check on the indiscriminate diversion of forest lands. Under the provisions of this Act, prior approval of the Central government is required for

diversion of forest land to non-forest purposes. Since the enactment of the Act, the rate of diversion of forest land has come down.