UNIT – II

Environmental Degradation: Economic significance and causes of environmental degradation- The Concepts of policy failure, externality and market failure-Economic analysis of environmental degradation – Equi –marginal principle.

Introduction

- Environmental degradation is the disintegration of the earth or deterioration of environment through the consumption of assets, for example, air, water and soil; the destruction of environments and the eradication of wildlife.

- It is characterized as any change or aggravation to nature's turf seen to be pernicious or undesirable.

- Ecological effect or degradation is created by the consolidation of an effectively substantial and expanding human populace, constantly expanding monetary development or per capita fortune and the application of asset exhausting and polluting technology.

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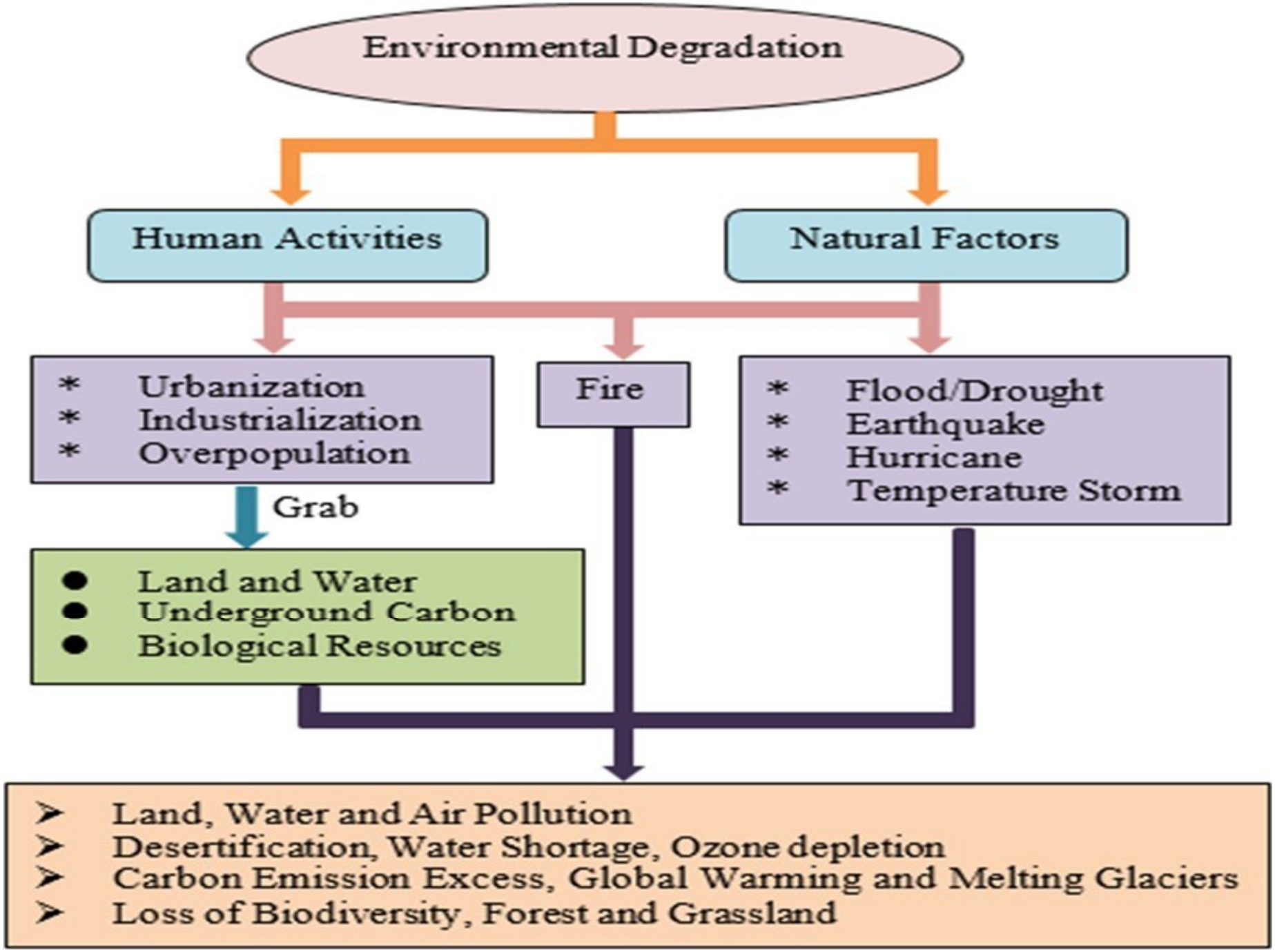

Environmental Degradation
Human Activities
Natural Factors
* Urbanization
* Industrialization
* Overpopulation
Fire
* Flood/Drought
* Earthquake
* Hurricane
* Temperature Storm
Grab
Land and Water
Underground Carbon
Biological Resources
Land, Water and Air Pollution
Desertification, Water Shortage, Ozone depletion
Carbon Emission Excess, Global Warming and Melting Glaciers
Loss of Biodiversity, Forest and Grassland

Cont

•Environmental degradation is one of the largest threats that are being looked at in the world today.

•The United Nations International Strategy for Disaster Reduction characterizes environmental degradation as the lessening of the limit of the earth to meet social and environmental destinations and needs.

•Environmental degradation can happen in a number of ways. At the point when environments are wrecked or common assets are exhausted, the environment is considered to be corrupted and harmed.

•There are a number of different techniques that are being used to prevent this, including environmental resource protection and general protection efforts.

Cont

•Environment issues can be seen by long term ecological effects, some of which can demolish whole environments.

•An environment is a unique unit and incorporates all the living and non-living components that live inside it.

•Plants and creatures are evident parts of the environment, but it also includes the things on which they depend on, for example, streams, lakes, and soils.

Types of Environmental Degradation

- **Land and soil degradation:** Degradation of soil quality from poor farming practices excessive use of fertilizers and pesticides, leakage from landfills etc.

- **Water degradation:** Pollution of water from trash dumped in oceans , illegal dumping disposal of large amounts of industrial waste into nearby rivers or lakes etc.

- **Atmospheric degradation:** This includes air degradation, particle pollution and the depletion of ozone layer.

- **Several other kinds of pollution:** Apart from land, water and atmospheric degradation, many other kinds of pollution such as noise pollution, light pollution that are part of environmental degradation.

Causes of Environmental Degradation

- Some environmental life species require substantial areas to help provide food, living space, and other different assets. These creatures are called area specific.

- At the point when the biome is divided, the vast patches of living space don't exist anymore.

- It becomes more troublesome for the wildlife to get the assets they need in order to survive.

- The environment goes on, even though the animals and plant life are not there to sustain it properly.

Cont

1. Land Disturbance

- A more basic cause of environmental degradation is land damage. Numerous weedy plant species, for example, garlic & mustard, are both foreign and obtrusive.

- A rupture in the environmental surroundings provides for them a chance to start growing and spreading. These plants can assume control over nature, eliminating the local greenery.

- The result is a territory with a solitary predominant plant which doesn't give satisfactory food assets to all the environmental life. Thus the whole environment can be destroyed because of these invasive species.

Cont

2. Pollution

•Pollution, in whatever form, whether it is air, water, land or noise is harmful to the environment.

•Air pollution pollutes the air that we breathe, which causes health issues.

•Water pollution degrades the quality of water that we use for drinking purposes.

•Land pollution results in the degradation of the earth's surface as a result of human activities.

•Noise pollution can cause irreparable damage to our ears when exposed to continuous large sounds like honking of vehicles on a busy road or machines producing large noise in a factory or a mill.

Cont

3. Overpopulation

•Rapid population growth puts strain on natural resources which results in the degradation of our environment.

• Mortality rate has gone down due to better medical facilities, which has resulted in an increased lifespan.

•More population simply means more demand for food, clothes and shelter.

•You need more space to grow food and provide homes to millions of people. This results in deforestation, which is another factor in environmental degradation.

Cont

4. Landfills

- Landfills pollute the environment and destroy the beauty of the city.

- Landfills come within the city due to the large amount of waste that gets generated by households, industries, factories and hospitals.

- Landfills pose a great risk to the health of the environment and the people who live there. Landfills produce a foul smell when burned and cause substantial environmental degradation.

Cont

5. Deforestation

•Deforestation is the cutting down of trees to make way for more homes and industries. Rapid growth in population and urban sprawl are two of the major causes of deforestation.

•Apart from that, the use of forest land for agriculture, animal grazing, harvest for fuel wood and logging are some of the other causes of deforestation. Deforestation contributes to global warming as decreased forest size puts carbon back into the environment.

6. Natural Causes

Things like avalanches, quakes, tidal waves, storms, and wildfires can totally crush nearby animal and plant groups to the point where they can no longer survive in those areas.

Effects of Environmental Degradation

1. Impact on Human Health

•Human health might be at the receiving end as a result of environmental degradation.

•Areas exposed to toxic air pollutants can cause respiratory problems like pneumonia and asthma. Millions of people are known to have died due to the indirect effects of air pollution.

2. Loss of Biodiversity

•Biodiversity is important for maintaining the balance of the ecosystem in the form of combating pollution, restoring nutrients, protecting water sources and stabilizing climate.

• Deforestation, global warming, overpopulation and pollution are a few of the major causes of loss of biodiversity.

Effects of Environmental Degradation

3. Ozone Layer Depletion

•The ozone layer is responsible for protecting the earth from harmful ultraviolet rays.

•The presence of chlorofluorocarbons, hydro chlorofluoro carbons in the atmosphere, is causing the ozone layer to deplete. As it will deplete, it will emit harmful radiation back to the earth.

4. Economic Impact

•The huge cost that a country may have to borne due to environmental degradation can have a significant economic impact in terms of restoration of green cover, cleaning up of landfills and protection of endangered species.

•The economic impact can also be in terms of the loss of the tourism industry.

Solutions to Environmental Degradation

1. Stop Deforestation

•In order to mitigate the adverse effects of environmental degradation, stopping deforestation is crucial for our environmental system.

•We cannot afford to cut or burn trees down as trees store greenhouse gases, produce oxygen and are the natural habitat for many animals and plants, which may become endangered if these forests are destroyed.

•An extensive afforestation campaign should be launched in the interest of environmental protection. We can further make a positive effect through reforestation or afforestation.
quite low.

Solutions to Environmental Degradation

2. Government Regulations

•Governments require intervening and setting a framework whenever there are problems that lead to significant eco-degradation.

•Governments set high taxes for activities that harm our planet and support environmentally-friendly behavior with financial subsidiesThese will also force industries and private people to avoid activities that lead to environmental degradation.

3. Fines and Punishment For Illegal dumping

•There should also be high fines for illegal dumping to reduce the adverse ecological consequences. People and industries will continue to dump their trash illegally as they know that even if they get caught, penalties are quite low.

Solutions to Environmental Degradation

4. Reduce Consumption Levels

•It has become essential to reduce our consumption levels. Our developed society always strives for the latest electronics, smart phones, and the trendiest clothes and so on.

•However, this behavior leads to huge resource depletion and excessive production of waste. We have to lower our consumption levels significantly to avoid the adverse ecological consequences.

5. Reuse and Reduce Waste Generation

•You can reduce waste production by using your items and food more efficiently.

Solutions to Environmental Degradation

•If you want to get rid of old but still working things, be creative to give it a new look or use it in another way.

•By doing so, your material things will be used more effectively. If they cannot be put to use anymore, separate them and give them for recycling.

6. Avoid Plastic

•Plastic waste is a big environmental problem that leads to significant plastic pollution and the degradation of our planet.
•In order to cut down plastic waste, avoid buying items with plastic wrapper or packaging, refrain from using disposal plastic bags, cups, plates, containers, cutlery, etc. Instead, bring your own reusable stuff, which can be reused several times.

Policy failure

•Despite decades of environmental law and policy making, the global environment remains harmed.

•Human-caused environmental degradation has become so severe and extensive that it threatens to breach several planetary boundaries, possibly making the Earth uninhabitable for humans and other species.

•Climate change and biodiversity loss may have already reached a tipping point, and other types of environmental damage – including freshwater depletion, ocean pollution, and degradation of ecosystems – may also soon become irrevocable.

•Are these bare outcomes a result of incomplete or fragmented environmental laws, ineffective policy design, poor implementation and enforcement, a lack of funding, or some combination of these and other factors

Policy failure

- Environmental policies suffer from three critical flaws.

- Firstly, they typically treat humans as separate from and superior to other parts of the environment, and therefore are premised on a flawed understanding of nature.

- Secondly, environmental policies tend to treat nature as a stationary, rather than a dynamic, system. As such, environmental policies focus on preserving natural spaces in some sort of idealized form, rather than allowing natural spaces to adapt and evolve.

- Thirdly, environmental policies also tend to treat humans as idealized economic actors – what behavioral economists call Homo economicus – rather than the irrational beings humans really are These three flaws have resulted in decades of environmental policies that are seemingly destined to fail.

Market Failure

•Market failure arises when the outcome of an economic transaction is not completely efficient, meaning that all costs and benefits related to the transaction are not limited to the buyer and the seller in the transaction.

•Individual consumers will often purchase goods with an environmental component to make up for their inability to directly purchase environmental goods, thus revealing the value they hold for certain aspects of environmental quality.

• For example, someone may buy a cabin on a lake in order to enjoy not only the home itself but also the lake's natural environment.

Market Failure

- If the individual could exclusively capture the environmental benefits that result from owning the cabin, the demand for cabins would reflect the full value of both the home and the environmental goods it provides, and the market for cabins would be efficient.

- Unfortunately, in the case of environmental goods, markets often fail to produce an efficient result, because it is rare that any one individual can incur the full benefit, as well as the cost, of a particular level of environmental quality. That is because environmental goods commonly suffer from the presence of externalities (that is, consequences that no one pays for) or a lack of property rights.

Externality

•An externality is a cost or benefit that is caused by one party but financially incurred or received by another.

• Externalities can be negative or positive.

•A negative externality is the indirect imposition of a cost by one party onto another.

•A positive externality, on the other hand, is when one party receives an indirect benefit as a result of actions taken by another.

•Externalities can stem from either the production or consumption of a good or service. The costs and benefits can be both private—to an individual or an organization—or social, meaning it can affect society as a whole.

Externality

- An externality is an event that occurs as a byproduct of another event occurring.

- An externality can be good or bad, often noted as a positive externality or negative externality.

- An externality can also be generated when something is made (i.e. a production externality) or used (i.e. a consumption externality).

- Pollution caused by commuting to work or a chemical spill caused by improperly stored waste are examples of externalities.

- Governments and companies can rectify externalities by financial and social measures.

Types of Externality

•Externalities can be broken into two different categories. First, externalities can be measured as good or bad as the side effects may enhance or be detrimental to an external party.

• These are referred to as positive or negative externalities. Second, externalities can be defined by how they are created. Most often, these are defined as a production or consumption externality.

•Negative Externalities

•Most externalities are negative. Pollution is a well-known negative externality.

• A corporation may decide to cut costs and increase profits by implementing new operations that are more harmful to the environment. The corporation realizes costs in the form of expanding operations but also generates returns that are higher than the costs.

Types of Externality

- **Positive Externalities**
- Some externalities are positive. Positive externalities occur when there is a positive gain on both the private level and social level.

- Research and development (R&D) conducted by a company can be a positive externality. R&D increases the private profits of a company but also has the added benefit of increasing the general level of knowledge within a society.

- Similarly, the emphasis on education is also a positive externality. Investment in education leads to a smarter and more intelligent workforce. Companies benefit from hiring employees who are educated because they are knowledgeable. This benefits employers because a better-educated workforce requires less investment in employee training and development costs.

Types of Externality

- **Production Externalities**

- A production externality is an instance where an industrial operation has a side effect.
- This is often the type of externality used as example, as it is easy to envision an environmental catastrophe caused by improperly stored chemicals by a chemical company.

- **Consumption Externalities**

- Externalities may also occur based on when or how a consumer base utilizes resources. Consider the example of how you get to work.
- Those who choose to drive are creating a pollution externality by driving their own car. Those who choose to take public transit or walk are not causing the same externality.

How can we identify externality

- Companies must be mindful of their entire production process when assessing production externalities.

- This includes not only implications of the final product but residual impacts of byproducts, disposal of items not used, and how antiquated equipment is handled.

- This also includes projecting outcomes of items yet to occur, such as waste yet to be properly disposed of.

- Consumers can identify consumption externalities by being mindful of the inputs and outputs that go beyond what they are attempting to achieve.

- Consider an example of an individual consuming alcohol. A consumer must be mindful that excessive drinking may lead to noise pollution, an unsafe environment, or adverse health effects.

How Do Economists Measure Externalities?

•Economists use two measures to evaluate an externality. First, economists use a cost-of-damages approach to evaluate what the expense would be to rectify the externality.

•As we may be seeing with greenhouse gas emissions, some externalities may extend beyond the point of repair.

•Another method of measuring externalities is the cost of control method.

• Instead of fixing the externality, economists measure what preemptive and preventative steps can be taken to stop the externality from occurring.

•Similar to how an actuary assesses a financial value to an event, economists may assign multiple financial measurements to an externality.

How Do Externalities Affect the Economy

- Externalities may positively or negatively affect the economy, although it is usually the latter.

- Externalities create situations where public policy or government intervention is needed to detract resources from one area to address the cost or exposure of another.

- Consider the example of an oil spill; instead of those funds going to support innovation, public programs, or economic development, resources may be inefficiently put towards fixing negative externalities.

Corrective instruments

•There are solutions that exist to overcome the negative effects of externalities. These can include those from both the public and private sectors

•**Taxes**

•Taxes are one solution to overcoming externalities. To help reduce the negative effects of certain externalities such as pollution, governments can impose a tax on the goods causing the externalities. The tax, called a pigovian tax.

•This tax is meant to discourage activities that impose a net cost to an unrelated third party.

•That means that the imposition of this type of tax will reduce the market outcome of the externality to an amount that is considered efficient.

Corrective instruments

- **Subsidies**
- Subsidies can also overcome negative externalities by encouraging the consumption of a positive externality.

- One example would be to subsidize orchards that plant fruit trees to provide positive externalities to beekeepers.

- This nudge has the potential to influence behavioral economics, as additional incentives one way or another way dictate the choices that are made.

- The subsidy is often placed on an opposing item to detract from a specific activity as well. For example, government incentives to upgrade to more energy-efficient renovations subtly discourages consumers against options with more externalities.

Corrective instruments

- **Other Government Regulation**
- Governments can also implement regulations to offset the effects of externalities.

- Regulation is considered the most common solution. The public often turns to governments to pass and enact legislation and regulation to curb the negative effects of externalities.

- Several examples include environmental regulations or health-related legislation.

- The primary issue with government regulation of externalities is the need for consistent and reliable information to track the externality is being managed or overcome. Consider regulation against pollution.

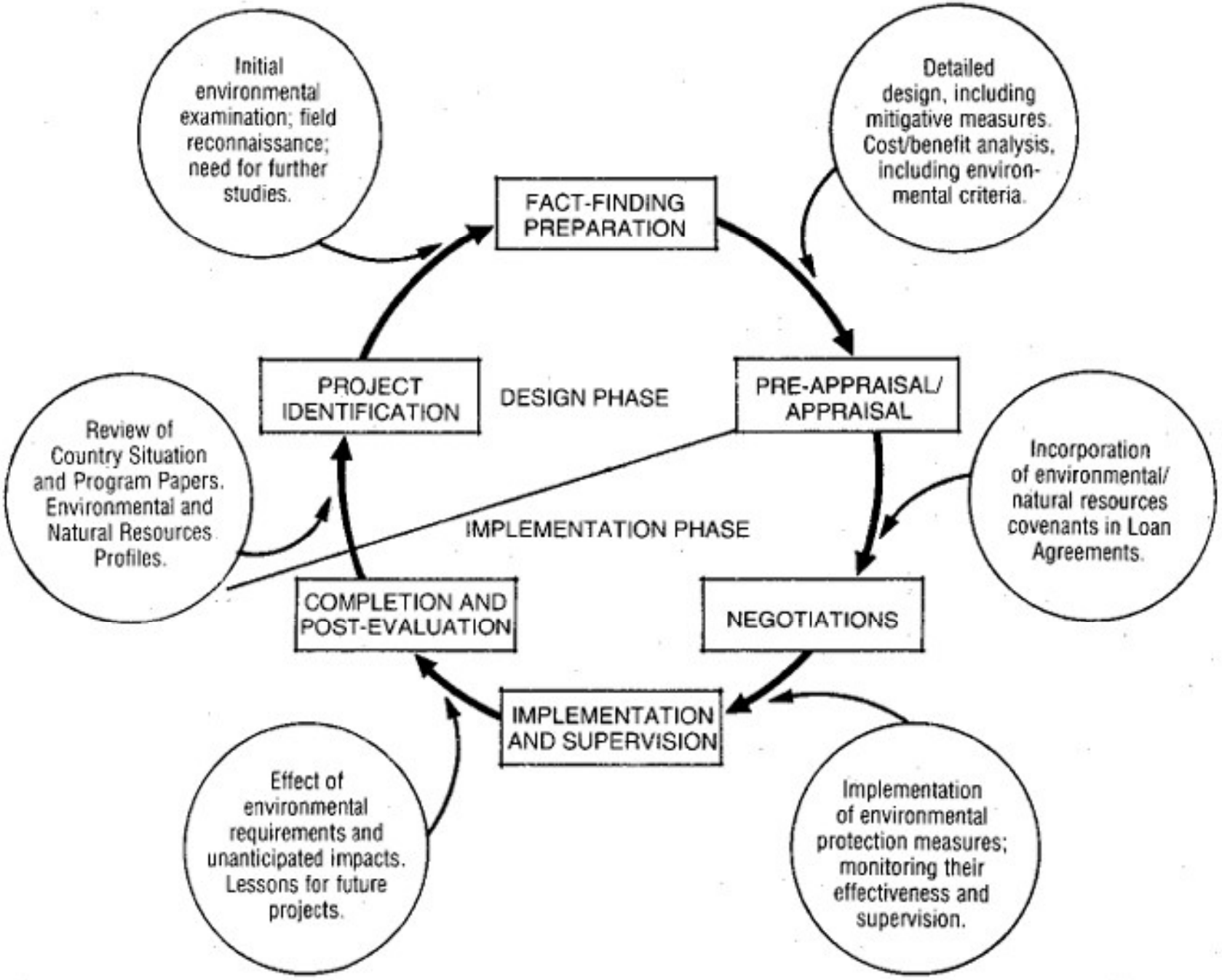
Economic analysis of environmental degradation

- The process of estimating the economic analysis of environmental degradation is useful in policy making on environmental and developmental issues.

- Despite advances made in the tools of economic analysis, there remains a number of un resolved problems regarding monetary valuation of environment.

- It is therefore important to keep some of the limitations of this environmental degradation in mind and use the findings with caution Some of the limiting factors are as follows:

Economic analysis of environmental degradation



Economic analysis of environmental degradation

(i) Natural resources of relative importance

•It is often argued that attributes of natural resource are of relative and not absolute importance to people.

•Some people even argue that no amount of money can compensate for damage to environmental resources even if estimation is done.

(ii) Whose and what values need to be assessed

•The question is often raised as to whose values need to be assessed.

•Considering only human values ignoring the value of environment for other species is unacceptable. Assessing the future value of environmental resources is difficult when we do not know the generation that is going to come.

Economic analysis of environmental degradation

•Even a perfect valuation of the preferences of existing consumers cannot provide any indication of the preferences of people in the future.

iii) Involves several subjective factors

•Since it involves several subjective factors, exactness of the valuation process itself raises several issues.

•Tools like revealed preferences when applied to environmental amenities are likely to be only partial measures of value.

•These processes assume that households are aware of various resources and are able to objectively decide on the value to be assigned to each resource.

Economic analysis of environmental degradation

•More over it may not be possible for individuals to discern the best possible option on an environmental issue especially when the individual does not have all the necessary information.

(iv) Difficulty in assessing future values

•Assessing future values for environmental resources is difficult as individual' preferences may change over time.

• These at best provide no more than an estimate for a single point in time. Additional care will have to be taken bythe time a decision is finally taken regarding an environmental issue

Economic analysis of environmental degradation

(v) Changes in technology and knowledge

•Technological change and improved knowledge in course of time e.g. the safe minimum standard for some environmental resource may be change over time

•Then valuations done earlier may loose significance. More comprehensive information is usually required on complex and poorly understood effects, such as the full value of ecological services to make valuation process more dependable.

(vi) Cost and feasibility of data collection

•In order to estimate the values of environmental resources which are so varied, a large number of observations relating to each resource are necessary. The advantages of obtaining such data must be assessed against the cost and feasibility of obtaining them.

Economic analysis of environmental degradation

(vii) Assessing social and political dimensions

•Estimating economic values rarely constitute the sole inputs to decision-making. Information about equity, cultural and social significance is also important inputs.

•Ethical issues relating environment into monetary values is highly debatable. Moreover, it may not always feasible or desirable to convert all environmental benefits and costs into money values. Political considerations also have a strong and sometimes over-riding influence on decisions.

•Thus, the utility of this process itself and the outcomes in terms of improving the welfare of people is highly subjective, therefore application of them to real economic issues depends on professional competence and judgment.

Equi-Marginal Principle

• The equimarginal principle states that consumers choose combinations of various goods in order to achieve maximum total utility.

•In other words, consumers will allocate spending their incomes across goods/services so that the marginal utility per dollar of expenditure on the final unit of each good purchased will be equal to all other goods purchased.

•It explains the way in which each consumer will spend portions of their income across a variety of different goods in such a way as to maximize their overall satisfaction.

Equi-Marginal Principle

The Equation for the Equal Marginal Principle

$$\frac{\text{Marginal Utility of A}}{\text{Price of A}} = \frac{\text{Marginal Utility of B}}{\text{Price of B}}$$

- According to the equimarginal principle, when a consumer is making purchasing decisions, they will consider both the marginal utility (MU) of goods along with the price of goods.

- Taking both of these into consideration, they will make a decision that balances both. This means, in effect, evaluating the good's MU/price—the marginal utility of expenditure on each unit of a good

Equi-Marginal Principle

Limitations of the Equimarginal Principle and Marginal Utility Theory

1. Consumers are not always rational
2. Consumers don't quantify utility
3. Many goods can't be split into units
4. Utility of goods depends on others

Equi-Marginal Principle

1. Consumers are not always rational

•Consumers will sometimes make economically irrational choices based on other reasons besides those that are quantifiable.

•Common influences outside of rationality include habits (people tend to repeat their purchasing habits once they're satisfied with a good or service) as well as emotional impulses (which things like advertising or personal experience can influence).

2. Consumers do not typically quantify utility

•In the real world, the concept of "utility" is likewise complex and difficult to quantify for most people.

• So when the average consumer is making purchasing decisions, they might have a general sense of the utility they will derive from a good, but are unlikely to quantify that level of utility.

Equi-Marginal Principle

•Assessing this can be even more difficult in light of how many products consumers have access to and the fluctuation of their income levels.

3. Many goods cannot be split into units

•The equimarginal principle quantifies goods as units, but many goods cannot be divided into smaller units, and can only function as a whole.

4. The utility of some goods depends on other goods

•When you buy a lamp, it has no real utility until you have also purchased light bulbs for it.

• That means that the utility of a lamp rests on having functional light bulbs and does not exist independently.