

GLOBAL ENVIRONMENTAL CRISIS

Causes of Environmental Crisis

An environmental issue is a known process (e.g. consumption of resource) that has negative effects on the sustainability of the environmental quality necessary for the well being of the organisms living in it. (Ahuja,1998)

Environmental crisis refers to an ecological crisis that occurs when the environment of a species or a population changes in a way that destabilizes its continued survival. Environmental degradation occurs when the earth's resources are depleted; especially water, air and soil. Degradation impacts on wildlife, plants, animals and micro-organisms. The major causes of environmental degradation include; urbanization, population growth, poverty, economic growth, intensification of agriculture increase in energy use, increase in transportation, among others.

1. Explosive growth of the world's human population.

A growing population places increasing demands on scarce resources, hence degrading the global ecosystem. Population growth is likely to outstrip the limited resources (carrying capacity). Hunger and malnutrition are common in developing countries as a result of high population growth. Rapidly growing populations have led to land, water and fuel wood shortages in the rural areas. In urban centers, crises stem from lack of sanitation and clean water. In most of the poorest areas of the globe, increasing population density has contributes to severe and accelerating degradation of the very resources that these growing populations depend on for their survival.

2. Poverty and the environment

Poverty is usually defined as one's inability to meet their basic economic need for clean air, water, food, shelter and health services. It exists everywhere but most cruel in developing countries, where more than one person in every five lives on less than one dollar a day. It is mainly the result of low capital accumulation resulting from low incomes, leading to low savings, low investment, and low productivity and back to low income and capital accumulation (vicious circle of poverty).

POLICY AND LEGAL ASPECTS OF ENVIRONMENT MANAGEMENT

Over the years, poverty has become one of the most difficult problems to eradicate. Sadly to note is the fact that poverty is endemic (persistent) in Africa, south of the Sahara and this is reflected in the low standards of health and general welfare as well as poor diet and housing.

Poverty stricken people are critically environment dependant. They often depend on the environment for their livelihood (fish, timber, wild fruits, charcoal, food, medicine). Some of these products are costumed directly and meet subsistence needs at household level or are sold for cash creating the so called environmental income, which is increasingly becoming recognized as an important source of income.

However due to poverty, land users use the available resources unsustainably, a problem that has led to land degradation. Our cultivation and over grazing has made the land vulnerable to soil erosion. Overuse of water resources has led to water degradation. Deforestation has led to destruction of vegetation. Poverty reduces the options available for rolling out some conservation practices because they require too much investment of land, capital and labor.

Similarly, poverty tends to encourage resource users to concentrate on immediate needs rather than on those whose benefits materializes in the long term.

Alleviating poverty is both a moral obligation and a prerequisite of environmental sustainability. The poor are both victims and agents of environmental destruction, about half of the world's poor live in rural areas that are environmentally fragile and they rely on natural resources over which they have little control.

Land hungry farmers encroach on marginal areas that are completely unsustainable for agricultural purposes such as steeply sloped, erosion prone, semi arid land where soil degradation is rapid and tropical forest where crop yields on clear fields decline sharply after a few years of cultivation.

Poor people in crowded squatters settlements frequently endure inadequate access to safe water and sanitation, as well as flooding and landslides, industrial accidents and emissions, and transport related pollution. The poor are always exposed to the greatest environmental health risk and they tend to be the most vulnerable to this risk because of their poverty.

Poor families often lack the reasons to avoid degrading the environment. The very poor struggling at the edge of subsistence are occupied by daily survival. It's not that the poor have short horizon; poor communities often have strong epic of stewardship in managing their resources. Their often poorly defined rights, their limited access to credit and insurance markets prevents them from

investing as much as they should in environmental protection. When they do make investments, they do need and expect quick results.

The poor are usually the main victims of environmental degradation. They live on degraded lands that are less expensive; and living in less productive and polluted lands gives the poor less opportunity to work their way out of poverty. For environmental policies to succeed in developing countries, they must first address the issue of landlessness, poverty and lack of access to institutional resources.

Insecure land tenure rights, lack of credit and inputs, and absence of information often prevent the poor from making resource-augmenting investments that would help preserve the environment. Deforestation for wood, timber and other products leaves such impact as uncontrolled flooding, drought, soil erosion, loss of river and underground water resources, declining agricultural production and accelerating desertification.

3. Growth versus the Environment

The poor cause considerable environmental destruction as a direct result of their poverty. However, as the income and consumption levels of everyone else in the economy also rise, there's a net increase in environmental destruction. As per-capita incomes rise, pollution and other forms of Kuznets's hypothesis (Environmental Kuznets curve), societies will have the means and the willingness to pay for environmental protection as their incomes rise. However, in the long-term, the damage, such as loss of biodiversity, may well prove to be irreversible.

4. Urban Development and Environment

Due to rural-urban migration, there's unprecedented rate of urban population growth; and an increasing strain on existing urban water supplies and sanitation facilities. About 50% of the people in third world cities do not have adequate supply of drinking water. Congestion, vehicular and industrial emissions and household stores inflate the environmental costs of urban crowding.

The resulting environmental ills pose extreme health hazards for the growing numbers of people exposed to them.

From the above factors, it is evident that as the total world population grows and incomes rise, net global environmental degradation is likely to worsen. Most cumulative environmental destruction to date has been caused by the developed world. With high fertility rates, rising average incomes and increasing greenhouse gas emissions in the developing world, this pattern is likely to reserve in coming years. E.g. China is now the world's largest greenhouse gas emitter, although lower on a per capita basis than most rich countries.

Effects of Environmental Crisis

i) Effects of Environmental Crisis on Social Systems

Social systems: The people in a society considered as a system organized by a characteristic pattern of relationships. There is interaction of at least 2 personal systems or 2 persons acting in their roles. It is the organizational form of a given society which is constituted by processes involving the mutual orientation of actions toward one another.

Human activities e.g. deforestation and industrialization are taking place so rapidly and have led to non-equilibrium in the environment. Environmental crisis, brought about by pollution of the environment, has affected our well-being in terms of damage to our health, buildings and structures etc

a) *Damage to health-* Environmental challenges in developing countries include health hazards created by lack of access to clean water and sanitation, indoor air pollution from biomass stores, deforestation and severe soil degradation. The principal health consequences of environmental damage include water pollution and scarcity, air pollution, solid and hazardous wastes, soil degradation, deforestation, loss of biodiversity and global warming-caused climate change.

Pollution can cause problems to both our mental and physical health. E.g. mentally, carbon dioxide in car exhaust fumes and smoke from factories causes headache and nausea. Physically,

smoke causes irritation of the eyes, nose, throat and skin, and is associated with serious diseases like asthma, lung cancer, sudden heart attacks etc. Polluted water in rivers, lakes and other water bodies are causes of diseases such as diarrhea, cholera and typhoid fever. Harmful substances in waste disposed improperly (e.g. in garbage dumps) cause environmental pollution.

Prevalence of unhealthy conditions is shared by both the urban and rural poor; especially lack of clean water and sanitation. This in turn contributes greatly to the spread of infectious diseases, such as typhoid, cholera, amoebic infection etc. Dependence on biomass fuels (e.g. wood, straw and mature) for cooking and boiling water create dangerously high levels of indoor pollution; resulting to respiratory diseases. About 400 million to 700 million people, especially women and children are exposed to indoor pollution; and about 4 million children die of respiratory diseases each year. (W.H.O)

b) Damage to buildings and structures

Air pollution causes damage to buildings. They get corroded, lose color and may peel. Acid rain which contains harmful quantities of sulphuric and nitric acids plays a part in destroying the beauty of buildings.

c) Increasing costs on people and government- when people are sick because of pollutants, the government spends more money on healthcare.

The ever-growing number of landless workers cultivate ecologically sensitive soils; leading to soil degradation and loss of productivity. As a result of rapid population increase and the failure of agricultural production to keep pace, per capita food production continues to decline especially in sub-Saharan Africa. High fish prices have been associated with over-fishing in restricted areas and environmentally destructive fishing practices.

ii) Effects on the natural systems

Natural Systems: This is a complex functioning system that includes the various spheres namely The solid earth-lithosphere, The atmosphere (gases enveloping the earth), `Biosphere-living organisms, and the Hydrosphere-water bodies

Note:

Economic growth and population expansion have created an unprecedented impact on the natural systems.

- 1) Humans clear land and divert waters, hence destroy habitats where a major component of the ecology is depleted or eliminated, and then all of its dependant species are also affected.
- 2) Humans are introducing organisms, e.g. foreign plants, which propagate rapidly. In other instances, native species are driven into extinction.
- 3) Emission of waste products directly damage natural ecologies. The outpouring of pollutants has grown rapidly, and the range of pollutants also has increased greatly e.g. the effects of chlorinated hydrocarbons in the atmosphere will take many decades to purge, and longer to degrade through the natural process. (E.g. the residues of the use of DDT between 1945-1975 are still present in living organisms today).
- 4) Humans are emitting waste products which impact primarily upon physical processes, e.g. climatic stability, atmospheric functionality and the behavior of ocean currents.

Consequences

Greenhouse gases increase global temperatures, thus affecting climate stability. Things become warmer and this affects the growth of crops (faster growth). More diseases are encountered (by humans, animals and crops). Oceans expand as they become warmer, sea levels rise. Low-lying areas (e.g. Bangladesh), will suffer extensive and permanent flooding. There will be more rain, stronger storms, shifting rainfall patterns.

Global Warming and Climate Change

Global warming refers to increasing average air and ocean temperatures, largely due to human, industrial, forestry and agricultural activities emitting green house gases. Most of the green house gases causing the pollution were emitted in developed countries, and developing nations will be reliant on the developed world to take immediate steps to reduce emissions, as well as to develop new technologies that will enable further reductions and successful adaptation to the already inevitable warming and resulting climate change.

Climate change refers to altering of underlying climate, such as increased temperatures, decreased annual precipitation or greater intensity of drought or storms. According to the Intergovernmental Panel on Climate Change (IPCC 2007), the developing world, particularly the

poorest countries, can expect major consequences from global warming, involving severe heat waves, hurricanes, floods from heavy rains, prolonged droughts, losses of valuable species, and crop and fish losses (extinction).

The most vulnerable zones are the sub-Saharan Africa, (due to drying), Asian mega deltas (due to flooding), small islands (due to multiple sensitivities) and the Arctic. In Africa, it is projected that the area suitable for agriculture, the length of growing seasons and yield potential will decrease. Yields from rain-fed agriculture could be reduced by 50% by 2020. Another effect in Africa will be water stress due to climate change. Coastal fisheries, mangroves and coral reefs will be further degraded and threatened by projected rises in sea level and storms.

Impacts of climate change

With energy-related carbon dioxide (CO₂) representing the majority of global greenhouse gas (GHG) emissions, the fight against climate change has become a defining factor for energy policy-making – but the implications are daunting. Meeting the emission goals currently pledged by countries under the United Nations Framework Convention on Climate Change (UNFCCC) would still leave the world some 13.7 billion tonnes of CO₂ – or 60% – above the level needed to remain on track with the 2°C goal in 2035. Much additional investment will need to be directed towards lower- CO₂ technologies, on supply and end-use sides alike. The benefits that society would reap from these measures, beyond avoided climate impacts, would be of an equal if not larger magnitude than the cost to the energy sector. Meanwhile, energy policy-makers need to start thinking about the impact of committed climate change on the security of the energy sector.

Agriculture

- Moderate warming and more carbon dioxide in the atmosphere may help plants to grow faster. However, more severe warming, floods, and drought may reduce yields.
- Livestock may be at risk, both directly from heat stress and indirectly from reduced quality of their food supply.
- Fisheries will be affected by changes in water temperature that shift species ranges, make waters more hospitable to invasive species, and change lifecycle timing.

Coastal Areas

- Climate change is likely to both increase electricity demand for cooling in the summer and decrease electricity, natural gas, heating oil, and wood demand for heating in the winter. New infrastructure investments may be necessary to meet increased energy demand, especially peak demand during heat waves.
- Climate change could affect the amount of water available to produce electricity or extract fuel. In areas where water is already scarce, competition for water between energy production and other uses could increase.
- Sea level rise and more frequent intense storms could disrupt energy production and delivery by damaging electricity infrastructure, fuel delivery infrastructure and equipment, power plants, or storage facilities.
- Climate change could put additional stress on coastal areas, which are already stressed by human activity, pollution, invasive species, and storms.
- Coastal development reduces the ability of natural systems to respond to climate changes.
- Sea level rise could erode and inundate coastal ecosystems and eliminate wetlands.
- Warmer and more acidic oceans are likely to disrupt coastal and marine ecosystems.

Ecosystems

- Climate change can alter where species live and how they interact, which could fundamentally transform current ecosystems.
- Impacts on one species can ripple through the food web and affect many organisms in an ecosystem.
- Mountain and arctic ecosystems and species are particularly sensitive to climate change.
- Projected warming could greatly increase the rate of species extinctions, especially in sensitive regions.

Energy

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Forests

- Climate change will likely alter the frequency and intensity of forest disturbances, including wildfires, storms, insect outbreaks, and the occurrence of invasive species.
- The productivity of forests could be affected by changes in temperature, precipitation and the amount of carbon dioxide in the air.
- Climate change will likely worsen the problems already faced by forests from land development and air pollution.

Human health

- A warmer climate is expected to both increase the risk of heat-related illnesses and death and worsen conditions for air quality.
- Climate change will likely increase the frequency and strength of extreme events (such as floods, droughts, and storms) that threaten human safety and health.
- Climate changes may allow some diseases to spread more easily.

Societies

- Climate change will affect certain groups more than others, particularly groups located in vulnerable areas and the poor, young, old, or sick.
- Cities are sensitive to many impacts, especially extreme weather impacts.
- Climate change may threaten people's jobs and livelihoods.

Water sources

- Warming temperatures, changes in precipitation, and sea level rise have affected and will likely continue to affect water supply and quality.
- Changes will vary in different regions of the United States; potential effects include increased flooding and drought, water quality impairment, and salt water intrusion to coastal water supplies.
- Changes to our water resources affect many sectors, including energy production, infrastructure, human health, agriculture, and ecosystems.

Transportation

- Climate change is likely to damage transportation infrastructure through higher temperatures, more severe storms, and higher storm surges.
- Coastal roads, railways and airports are vulnerable to sea level rise, which could lead to delays as well as temporary and permanent closures.
- Warmer winters can alleviate the costs of clearing ice and snow, especially in northern areas.

Internationally

- Countries around the world will likely face climate change impacts that affect a wide variety of sectors, from water resources to human health to ecosystems.

POLICY AND LEGAL ASPECTS OF ENVIRONMENT MANAGEMENT

- Impacts will vary by region and by population.
- Many people in developing countries are more vulnerable to climate change impacts than people in developed countries.
- Impacts across the globe can have national security implications for the United States and other nations.

Addressing global warming and climate change

- i. Plant native, drought-resistant trees and shrubs around your home and outdoor air conditioning unit.
- ii. Use an electric or push mower instead of a gasoline-powered mower to cut your lawn.
- iii. Replace your current home appliances (refrigerator, washing machine, dish washer) with high-efficiency models.
- iv. Buy food and other products with reusable or recyclable packaging instead of those in non-recyclable packaging.
- v. Buy energy efficient products
- vi. Conserve energy at home and at work
- vii. Plant trees
- viii. Reduce, reuse and recycle
- ix. Make wise transportation choices
- x. Install a solar heated system to provide your hot water.
- xi. Insulate your home, clean your air conditioning filters and install energy efficient showerheads.

Environmental issues in Kenya

In the recent decades, there has been a global awakening on the environmental issues. Several conferences have been prepared to address these concerns in different cities in the world. This has been prompted by realization that due to environmental degradation, there have been serious consequences such as drought, hunger and global warming that

have threatened the existence of mankind and unless some drastic steps are taken urgently there is a bleak future for the coming generations. This has prompted many countries to adopt measures that would reverse the detrimental effects of environmental degradation. In Kenya, the effect of environmental degradation has been felt. Due to corruption and lack of political goodwill, much environmental destruction has been witnessed since independence in 1963 and the consequences has been long spells of drought, hunger, sicknesses that have led to death not only on domestic and wild animals but also human beings. Different regimes have come up with different approaches on strategies to tackle environmental issues but the war seems far from being over.

Serious environmental issues in Kenya include:

- Pollution AND Extensive Deforestation
- Land and soil degradation AND Climate change
- Pests and diseases/invasive species AND Extinction of plant and animal species
- Deposition of hazardous wastes AND Increased CO₂ in the atmosphere
- Depletion of the ozone layer and the Loss of high potential agricultural land to settlements

Example: Pollution

This is the contamination of a healthy environment by man-made waste. Industries which specialize in the science, technology and processing of metals, these plants produce highly concentrated and toxic waste which can contribute to pollution of ground water and air when not properly disposed.

Point source pollution is a stationary location or fixed facility from which pollutants are discharged or emitted or any single identifiable discharge point of pollution. Such pollutant load discharge at a specific location such as pipes, outfalls, smokestacks, conveyance channel from waste water treatment plant or human waste treatment facilities.

Other point source which are easily identified and regulated activity include

a) Operational waste from industries

b) Combined sewer outfalls

c) Noise pollution from a jet engine

d) Light pollution from an intrusive street light

Factories and sewerage treatment are two common types of point source. Factories discharge their treatments into water bodies. Unregulated discharge from point source pollution can result into water pollution and unsafe drinking water and can restrict activities like fishing and swimming.

Large farms that raise livestock such as, cows, pigs and chicken are other source of point of source pollution. To control point source discharge there must be strict pollution discharge system using modern and latest technology by factories to treat efficient and reduce pollutant.

Non point source pollution does not come from a specific source, instead it originates from many different sources. Non point source pollution is caused when rainfall or snow melt is moving over and through the ground. The rainfall moves picking up, and carrying natural and human-made pollutant discharge, and finally depositing them into water bodies like rivers, wetland, coastal waters and to the underground source of drinking water.

The pollutant includes.

- Excess residue fertilizer herbicides and chemicals from agricultural lands and residential areas.
- Sediment from improperly managed construction sites, agricultural, forest lands and eroding stream banks AND Oil, grease and other toxic chemical discharge from urban runoff
- Salt from irrigation activities AND Acid drainage from abandoned mines.
- Bacterial and nutrients from livestock pet wastes AND Discharge from facility septic systems.

Non point source pollution result from wide variety of human activities to the land and have harmful effects on quality of drinking water supplies, recreation facilities, fisheries and wildlife.

Agriculture and environmental policies

Agriculture has a major impact on the environment, especially on land, water and biodiversity. Over the last 10 - 15 years, the environmental performance of agriculture has been mixed. For example, nitrogen and pesticide loading in water remain relatively high and risks of soil erosion and water resource depletion persist in many regions and countries. In recent years, however, there have been improvements in wildlife habitats, landscapes and sinks for greenhouse gases provided by agriculture, but the most significant progress has occurred where environmental pressures have been greatest.

The main environmental impacts of agriculture may be characterised through the beneficial or harmful contribution of agricultural activities to:

- soil quality (e.g., erosion, nutrient supply, moisture balance, salinity, etc.);
- land quality (e.g., ecological management of agricultural land);
- water quality (e.g., nutrient, pesticide and sediment run-off and leaching, salinity);
- water quantity (e.g., irrigation consumption, use efficiency, water retention capacity, flood prevention, etc.);
- air quality (e.g., emissions of dust, odours, ammonia and greenhouse gas, absorption of carbon dioxide, etc.);
- bio-diversity (e.g., farm and indigenous animal and plant diversity);
- wildlife and semi-natural habitats (e.g., diversity of animal and plant habitats associated with farming);

- rural landscape (e.g., environmental features of areas shaped by farming, including those associated with historic buildings and landmarks, etc.).

Agricultural policies in India provide substantial farm support, often linked to commodity production affecting resource use, farming practices and environmental performance. Reconciling food production and environmental goals, however, is a challenge. But, reconciling them implies that the rights and responsibilities of farmers regarding farm practices need to be clearly defined and applied, and thus the situations under which they are entitled to remuneration or obliged to pay (polluter-pays-principle or PPP). Defining who pays and who is paid for the desired level of environmental performance has important implications for the distribution of income and wealth.

Role of agro-environmental policies

When private and public mechanisms designed to facilitate the improvement and diffusion of appropriate farming practices and market forces are not enough to ensure the supply to meet the demand of environmental services, specific agriculture-environmental measures at the farm level may be needed. Such measures may be necessary to reduce the environmental harm, or enhance the environmental benefits of farming activities. When designing and implementing such policy measures, a number of general policy principles should be taken into account in the choice of the type of policy incentive or disincentive – payment or tax.

The PPP applies to reducing environmental harm for which farmers, as any other polluter, should be accountable. However, the PPP guiding principles recognise the possibility of different property rights and reference levels among countries, with the

possibility of offering transitional financial incentives to encourage farmers to adopt appropriate production practices for improving their environmental performance through reducing environmental harm. It includes the case of transitional financial assistance provided to stimulate the development of new pollution control technologies and abatement equipment to achieve a better environmental performance through improved production practices.

General policy principles

When markets do not exist to allocate costs and benefits of agriculture-environmental impacts and outputs, policy action may be needed to account for the costs of not respecting environmental targets and to ensure the provision of environmental benefits. When designing and implementing policy measures, the environmental problem needs to be clearly defined and the following principles for policy design need to be kept in mind:

- The necessary condition for a welfare gain from implementing an agriculture-environmental policy measure is that the resulting environmental benefits exceed the costs associated with the policy. These costs include those due to a reduction in outputs, associated with more environmentally friendly technologies and practices and the transaction (administrative) costs of policy implementation and enforcement.
- When farmers and other economic agents provide a specific environmental service, the level of benefit should be clearly specified and efforts made to ensure that the most efficient operator is the provider.
- When a specific environmental outcome is jointly the result of agricultural output, a wide range of policy options and approaches may achieve its provision by an individual farmer

that either provides positive incentives (through, for example, a payment) or negative incentives (e.g., a tax). If incentives were set correctly, it would be in the individual farmer's interest to achieve the outcome and receive the incentive payment, or achieve the outcome and avoid paying the tax.

- The effectiveness of either a tax or a payment depends not only on whether it correctly confronts the farmer with the opportunity costs of not respecting environmental requirements, but also on the degree to which the associated obligations can be enforced and tailored to local environmental circumstances and demands. The more the payment or tax is tailored to specific circumstances, the larger the need for monitoring, the lower the probability of individual control, and the higher the transaction costs.

In addition to what we have discussed, an environmental policy that conserves the ecosystem is a sagacious attempt to manage the environment. We will explain this in Subsection 2.1.4.

2.1.4 Ecosystem and environmental policies

The objective of ecosystem conservation and management as stipulated in the Forest Policy (MNRT, 1998a) is to ensure ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility. Forest biodiversity is faced with problems of encroachment, shifting cultivation, wild fires, lack of systematic forest management and inadequate infrastructure and staff to prevent excessive resource use.

Watershed management and soil conservation face similar problems as biodiversity conservation due to increase in population pressure and inefficient forest management and protection in watershed areas. Poor management and protection have resulted in deterioration of watershed areas causing water

shortages. Planting of inappropriate species in watershed areas, illegal logging and inappropriate logging methods have further reduced the quantity and quality of water and are the cause of peak floods, droughts and sedimentation in rivers. Erosion due to cultivation on the riverbanks outside forest reserves is also a major concern in watershed management.

Encroachment, wildfires, illegal logging and poaching are also the major factors contributing to the deterioration of wildlife populations in natural forests. Inadequacy of baseline data on types of wildlife species, their habitats and the lack of incorporating wildlife management in forest management plans, are the major reasons hampering wildlife conservation in forest reserves. Also, coordination among the government institutions involved in wildlife and forest management is very poor.

In order to minimise the damage to the ecosystem due to human activities, the Forest Policy stipulates environmental impact assessment (EIA) before implementing developmental projects, which convert forest land to other land uses such as timber industries, mining, road construction, agriculture, dams, settlements, shrimp farming and tourism. The scope and guidelines of a EIA is to be prepared in collaboration with other sectors and stakeholders.

Specifically, in order to achieve ecosystem conservation and management in the areas of biodiversity, watershed management and soil conservation, and wildlife, we need to consider:

- New forest reserves for biodiversity conservation in areas of high biodiversity value. Forest reserves with protection objectives of national strategic importance may be declared as nature reserves.

- Biodiversity conservation and management is to be included in the management plans for all protection of forests. Involvement of local communities and other stakeholders in conservation and management is to be encouraged through joint management agreements.
- Biodiversity research and information dissemination should be strengthened in order to improve biodiversity conservation and management.
- Biodiversity conservation must be incorporated in the management regimes of natural production forests and plantations. Management plans must incorporate biodiversity conservation and management guidelines. This minimises the replacement of natural forests by exotic plantations.
- Watershed management and soil conservation should be included in the management plans for all protection and production forests. Involvement of local communities and other stakeholders in watershed management and soil conservation will be encouraged through joint management agreements.
- Research and information dissemination must be strengthened in order to improve watershed management and soil conservation.
- EIA is required for the investments, which convert forestland to other land use or may cause potential damage to the forest environment.

Having looked at some of the sectoral policies that influence environment policies, let us now discuss the instruments used in implementing these policies.