The environment

# Introduction

## The state of the environment

Alarming messages have been heard in recent years about the state of the biosphere and its future. Almost every week we are informed of a new ecological disaster or a new attack on nature that has remained unsuspected until now. A simple comparison of the state of the planet in 1960, 1970, 1980 and today illustrates the speed with which the situation is deteriorating. One can seriously wonder, if things continue at this rate, how much longer the planet will remain habitable.

It would be difficult to underestimate the seriousness of the situation. The increasingly precise data on the depletion of the ozone layer, on the increase in carbon dioxide in the atmosphere and on the number of toxic products being released into the biosphere are of great concern. Although the effect of these changes is not yet known for sure, it is already known that they could be serious. This is enough to justify our concern.

It is clear that men, by appropriating the earth's space, have turned it upside down.

Human intervention in natural ecosystems is one of the main causes of change or imbalance. Even if there are natural causes such as floods, fires, earthquakes or diseases, human activities affect all ecosystems, and some are more threatened than others.

## J0293240The notion of ecosystem

The ecosystem is the key element of plant and animal life. It can be defined as a population of plants and animals that share the habitat that is most suitable for them and whose elements interact with each other and with the abiotic components of the environment. The biological community and the non-living environment form a functional whole: the ecological system or ecosystem.

No change can occur in an ecosystem without triggering a series of events that can often have system-wide repercussions. Because of the interconnectedness of ecosystems, if there is a change in one, others may be affected.

# Ecological resources

## The atmosphere

Air is a mixture of gases that forms a layer around the Earth that is 30 to 40 km thick. This envelope constitutes the Earth's atmosphere, essential to life on our solar system, the Earth is the only planet with an atmosphere where life is possible. la planet. Dans

Ordinarily, in the study of air quality, we are interested in two atmospheric factors: air pollution and climate. Air pollution is mainly the result of the dispersion of emissions such as fumes, gases and dust. Natural phenomena such as forest fires and volcanic eruptions can also lead to the release of pollutants into the air.

Climate, on the other hand, is a natural atmospheric character and an environmental factor of primary importance among those that determine the nature of animal and plant life as well as the distribution of species in the biosphere. The negative influence that certain human activities can have on air quality and even on the climate, due to pollution or other effects they cause, such as the consequences of large-scale deforestation, is a cause for concern.

## Water

A continuously repeated cycle ensures the distribution of water on our planet and allows Life to maintain itself there:

Solar energy and gravity cause water to move water from oceans, lakes, rivers, soil and plants to the atmosphere where it evaporates

Water in the atmosphere falls back onto land and oceans as fresh water

Water from the land flows back to the seas and oceans.

### Fresh water

MCj03330280000[1]Although 97.1% of the water on Earth is contained in the oceans and salt lakes, it cannot be used for agriculture or human consumption. The Earth's fresh water accessible by humans represents, in fact, 0.32% of the total water. It is found in lakes, rivers and groundwater. However, it is estimated that 99% of these sources are eliminated by pollution or a location that is too remote.

Twenty percent of all the world's fresh water, and almost all the water available in the United States, comes from the Great Lakes. Toxic residues from chemical discharges can be considered the most serious pollution problem to affect the Great Lakes. Lakes are particularly vulnerable to pollution because they are by nature a closed system. They cannot empty themselves of the polluting substances that are deposited or dumped in their depths.

### The Ocean

The ocean is still the main receptacle for the world's sewage and drainage. Insofar as the ocean seems to be an unlimited resource, the relationship between it and man has always been based on exploitation. Pollution is destroying unique ecosystems that are essential links in the food chain. When we know that the distribution of marine life in the oceans is concentrated along the coasts, we can assume that this habitat is greatly threatened.

## Earth

### Forests

MCj02153400000[1]Forests are complex systems with many interrelated processes involving living organisms and abiotic elements. Forests are indispensable parts of the planet's ecosystem and play a vital role in nutrient cycling and in maintaining the quality of the atmosphere, both locally and globally.

In general, forests temper the local climate and have a regulating effect on waterways. Often, in large deforested areas, conditions are more extreme and are characterized by flash floods and droughts. Forests mitigate the impact of rain on the soil, reducing erosion, and because of the protection provided by the foliage of the trees, they temper the drying effect of the sun and wind. Finally, thanks to the transpiration of trees, the water from the rainfall returns to the atmosphere.

Forests are the places where the biodiversity of a region is maintained, because they contain many living species, each of which has genetic variations. It is diversity that allows our forests to adapt to changes in the environment. In this way, the conservation of natural forests contributes to the preservation of regional and global biological diversity, which is an essential foundation for environmental quality and economic development.

### Agricultural land

The agricultural potential of a region depends on the geophysical nature of the terrain and the climatic conditions. Agricultural ecosystems, the complex collection of interacting plants, animals, soils and water that make up agricultural land, are human-modified ecosystems. Environmental factors determine the agricultural potential of a given piece of land, but it is through land clearing and cultivation that this land becomes agricultural land. Agricultural productivity can only be achieved through the management of soils, crops and animals.

### Flora and fauna

Flora and fauna include all animal and plant species that are not domesticated by humans. They have intrinsic value, as well as social, cultural and economic value. In addition to meeting many of our material needs, flora and fauna are essential to the proper functioning of ecosystems.

## Resource Utilization

Human beings use natural resources in a variety of ways to ensure their livelihood and improve their quality of life. Often, the pressure on these resources is intensified as a result of the increased demand of the growing population.

Renewable resources are those that are replaced on a continuous basis by natural phenomena. Such resources remain renewable in the long term only if they are managed judiciously, they are renewable, but not inexhaustible.

### Cultivation practices

While improving yields, modern farming practices have caused several environmental problems such as soil deterioration, siltation of aquatic habitat, pollution of freshwater ecosystems and contamination of groundwater.

### Logging

Deforestation is an old form of environmental transformation: land had to be cleared before cultivation could be done. Cultivable land is growing for those who lack land, mining and timber exploitation supports the economy, but at the risk of deteriorating the soil, or even modifying the planet's climate.

The forests of North America and Europe are under major attack. The demand for land clearing to create urban, industrial or commercial areas is ever more pressing. The development of transport routes is constantly increasing. Commercial exploitation gives rise to deforestation. Acid rain leads to forest dieback.

The forest is in danger in both the North and the South, but in the North, we are starting to reforest, while in the South deforestation is increasing. In Latin America, the Amazon, with 7 million hectares lost per year, is the most threatened region.

#### The Rainforest

The tropical forest is the product of a thousand-year-old process, while the destruction of entire swathes of forests takes a few hours. The after-effects will sometimes be felt for centuries because, most of the time, the soil is surprisingly poor. Indeed, the nutrients of the forest became self-managed, we can no longer cultivate if we destroy it.

The tropical forest is losing 100,000 km2 per year, at a more than worrying rate that tends to accelerate. The consequences are catastrophic for the environment and the economy of the countries concerned. But they are harmful to the entire planet: loss of genetic heritage, disappearance of ethnic groups and, most vitally, reinforcement of the process of climate change.

Tropical forests participate in the circulation of carbon through the biosphere. They are both a carbon reservoir and a regulator of the thermal and water balance. The destruction of carbon releases CO2 into the atmosphere, thus increasing the greenhouse effect.

# Damage to the environment

## Types of pollution

Pollution can be defined as any physical, chemical or biological alteration of the air, water or soil, which is harmful to living organisms.

### Air pollutants

Air pollutants are traditionally divided into two broad categories, common pollutants and toxic pollutants.

Common air contaminants include sulphur dioxide, nitrogen oxide, suspended particulate matter, lower troposphere ozone, and carbon monoxide. Another contaminant that could be added to this list, given its major role as a greenhouse gas, is carbon dioxide.

Most air pollutants are toxic, if their concentration is high enough. However, some pollutants are toxic even at relatively low concentrations. There are at least several hundred of these toxic air pollutants, which are generated by a multitude of sources, particularly in the world's industrialized countries. This group of contaminants includes pesticide residues, lead, mercury and asbestos.

### Industrial pollution

Several industrial activities generate various pollutants, which are released into the atmosphere and into fresh and salt waters, causing various environmental damages.

In an industrial society, the production of goods takes place through a variety of processes, for example: manufacturing, thermal power generation, and mining or forestry. These processes often generate waste products as by-products that may be released into the environment deliberately or accidentally. Depending on the toxicity of the waste and the degree of treatment prior to discharge, it can have a significant effect on the environment.

#### Pollutants from diffuse sources

In addition to easily identifiable point sources of pollution, human activities are also responsible for several diffuse sources that release a wide range of substances that can contaminate the environment.

Sources of non-point source pollution include runoff from agricultural and forestry activities, urban runoff, motor vehicle emissions, and the release of CFCs

***The release of chlorofluorocarbons (CFCs)***

Chlorofluorocarbons (CFCs) are groups of synthetic (man-made) chemicals, containing carbon, fluorine, chlorine and sometimes hydrogen, that were developed in the early 1930s.

CFCs are mainly found as propellants in aerosol cans, refrigerants in refrigerators and air conditioners, as well as in insulating materials such as foams or plastics, and in industrial solvents.

#### Effects on the ozone layer

A hole has indeed appeared in the ozone layer. Its existence is largely attributed to the presence of chlorofluorocarbons (CFCs) in the atmosphere. CFCs released into the air at ground level slowly rise into the atmosphere until they reach the stratosphere, where they dissociate and release chlorine that combines with ozone. Subsequent reactions release oxygen and chlorine, and the process repeats. Thus, a single molecule of chlorine can destroy up to 100,000 molecules of ozone.

The damaged ozone layer allows deadly ultraviolet radiation to pass through, which then reaches the planet. The effects of this radiation will manifest themselves in the increased incidence of skin cancers, a major depression of the immune systems, an increase in the level of smog, a decrease in agricultural yields, and a deterioration in marine harvests. Even more important is the relationship between ozone depletion, global warming, and the destruction of ocean phytoplankton, which is the first link in the food chain.

### Municipal waste and hazardous waste

#### Urban wastewater

Wastewater can be harmful to the environment and human health when it contains wastes that increase oxygen demand, pathogenic organisms, plant nutrients, heavy metals and synthetic organic chemicals.

***Dangerous waste***

The problems posed by hazardous waste are worrying. Hazardous wastes are wastes that, due to their nature or quantity, may be harmful to human health or the environment, and which require special disposal techniques.

Improper disposal of hazardous waste, through landfilling or sewerage, and accidental discharge of such substances can be harmful to the environment. Affected groundwater and surface water can become contaminated. Air quality can also be affected by fires. Finally, human health can also suffer the negative consequences.

# Conclusion

Life on the planet is based on a delicate balance, on a system of interdependence uniting plants, animals and the environments in which they live. Earth is home to an endless variety of ecosystems – in the air, in the water, and on land – whose survival ultimately depends on those of others.

Today, we realize that if we cause a crisis in an environment or if we destroy even a single habitat, every being on this planet is directly affected.

In assessing the state of the environment, it is important to consider the conditions in each of the ecological zones. Each area is different from the others and reacts to the many assaults it experiences in a way that is unique to it.