

Institute of Natural and Life Sciences

Biological Sciences, / Agronomic Sciences / Semester 3 / Section A

Chapter I:

Introduction to the concept of environment

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1.1 Definition of the environment

The environment is defined as the set of elements that surround a species. Some of these elements contribute to ensuring the natural needs of the species.

The environment can also be defined as the composition of natural physical, chemical or biological conditions that act on living organisms and human activities.

1.1.1 General definition

More generally, the environment is considered as the set of factors that have an influence on the environment of human beings. This definition places man at the center of civilization.

A much broader notion of the environment concerns the protection of the natural environment, land use planning and the protection of natural or historical sites.

1.1.2 Legal definition

In 1967, a first European directive legally defined the environment as: water, air and soil, as well as the relationships between these elements on the one hand, and with all living organisms on the other.

Currently, the following definition exists in legal texts: "set of elements which in the complexity of their relationships constitute the framework, the environment and the living conditions of man as they are or as they are felt."

In Algeria, the legislation defines the environment in Law No. 03-10 of July 19, 2003 as follows: "abiotic and biotic natural resources such as air, atmosphere, water, soil and subsoil, fauna and flora including genetic heritage, interactions between said resources as well as sites, landscapes and natural monuments."

1.2 Brief history

Before the 19th century, the notion of environment had a consonance of respect for life and living beings. The concepts of economic, natural or urban environment did not seem to exist.

From the 19th century, the artistic community such as the Romantic movement highlighted the beauty of wild natural landscapes and therefore the need to preserve these precious assets. The first protected natural site was created in 1864 in the United States by President Lincoln in the form of a national park in Yosemite Valley. Several national parks have since been created in different countries around the world.

In 1896, Arrhenius studied the effect of increasing CO₂ in the atmosphere. He first cited water vapor and CO₂ as greenhouse gases.

At the end of the 19th century, the first ecological disasters appeared with the development of the industrial revolution, which caused a very sharp increase in the consumption of natural resources.

The 20th century saw the first visible ecological disasters, such as oil spills and industrial pollution. Scientists began to understand pollution phenomena and to warn the international community about the effects of this pollution. Following an awareness of these problems, several international conferences were held and protocols were signed.

The first international conference was in Stockholm in 1972, followed by Rio de Janeiro in 1992.

Algerian legislation on environmental protection includes several laws that continue to evolve over time based on new data. The first laws date from 1978 and 1983 and concern the protection of sites and the creation of national parks. More recent laws, the last of which date from 2015, concern the creation of the National Observatory of the Environment and Sustainable Development as well as the National Environment Fund, not to mention other laws and decrees relating to the protection of the coastline and the development of clean energy.

1.3 Man and the environment

Man is primarily responsible for the changes taking place in the environment through his activities and lifestyle which are constantly evolving. He has both harmful and beneficial effects on the environment.

1.3.1 Adverse effects of man on the environment

Among the destructive effects of man on the environment, the increase in the world population leads to the construction of more and more houses and the expansion of cities. This expansion causes the appearance of construction sites, the earthworks of land and the development of roads and links between cities, which considerably modifies the landscape and transforms nature. The increasing number of means of transport causes air pollution. The enormous quantities of household waste due to the increase in the world population are very difficult or even impossible to manage at present, despite the different techniques that exist to destroy them while minimizing pollution.

The extraction of minerals and materials needed for construction, such as rock, sand and gravel extracted from quarries, also changes the landscape and disrupts the surrounding natural environment. Deforestation and the creation of dams also play a harmful role in destroying the balance of natural environments and contribute to the disappearance of animal and plant species.

The industry produces all kinds of waste: solid, liquid or gaseous, which currently constitute a real environmental problem. The chemical industry causes pollution of rivers and streams, making them unfit for fishing and consumption. The quality of the water is deteriorating and dozens of diseases affecting humans, aquatic fauna and flora are appearing.

Oil spills caused by oil spills in the seas and oceans are real ecological disasters because they cause the loss of hundreds of fish and seabirds.

Intensive fishing is the cause of the disappearance of certain marine species and the reduction of global fish stocks.

Finally, the introduction of certain devastating species produces the destruction of the natural balance and causes the extinction of species native to the environment in question.

1.3.2 Positive effects of man on the environment

Man also has a positive impact on the environment. This is proven by the legislation in favour of ecology in almost all countries of the world.

Current trends around the world to reduce pollution are beginning to be palpable. Some industrial or household waste is recycled. The law increasingly regulates the discharge of harmful waste. The latter is sorted, recovered and treated in suitable places such as incinerators, or even transformed into energy. Recycling also makes it possible to recover the raw material and therefore save it, while preventing it from polluting nature.

Wastewater treatment plants also make it possible to recover wastewater treatment plants and turn them into biogas, which is used to produce thermal and electrical energy.

Protecting forests against desertification and deforestation is also a positive action of man on the environment. The fauna and flora are safeguarded and the species that live there are thus preserved. The creation of national parks and protected reserves as well as the regulation of hunting and fishing currently make it possible to significantly reduce the destructive effects of man on nature.

Components of an environment

Observation of reality shows that there are dynamic interactions between human beings, community groups and the biosphere. These interactions, in perpetual evolution, between the human environment (culture) and the biophysical environment (nature) give rise to managed, constructed or, generally speaking, modified environments.

The environment includes the following four components:

1. abiotic factors of the environment: climate, soil (biotope)
2. biotic factors: vegetation, fauna (biocenosis)
3. population (human beings)
4. culture (i.e. everything that emanates from the human spirit)

These four components constitute hierarchically arranged systems. The first two categories correspond to the ecosystem; let us recall here the hierarchy of Gausson factors: climate, soil, vegetation, fauna. The concept of environment adds man and all his activities, considered in their dynamic and evolving relationships with ecosystems, natural or modified. It thus allows us to grasp reality in its entirety and, therefore, in its complexity. "The environment is a set of environments of influences (human, natural, economic environments) which act on the individual at all times of his daily life and largely determine his behavior in all dimensions of being: social, intellectual, emotional, spiritual, cultural".

By its very essence, the environment evokes a whole, considered as a dynamic system, made up of subsystems (physical, biological, ecological, economic, political, sociological, cultural, etc.).

The concept of environment, considered in a systemic sense, has the following fundamental characteristics:

- It emphasizes the relationships between living organisms and the environment, and the dynamic interactions between components of the system;
- It favors the global and systemic approach;
- It promotes diversity that should be preserved and increased (notion of biodiversity);
- It has a broad scope and aims to improve the quality of the living environment (which is also the purpose of regional planning);
- It is situated in a long-term perspective;

- It leads to extending the concerns of intervention agents to human well-being.

The evolution of ideas regarding the environment is characterized by a constant broadening along five axes:

1 The kinetic axis (speed). Changes have become the rule; the speed at which discoveries and their applications are made is constantly reducing; the conceptual bases of development and the environment are enriched incessantly, and rapidly. Two decades ago, the environment was hardly talked about.

2 The temporal axis (time). Here the idea of sustainability intervenes; the broadening of concerns leads to the need for long-term planning, indispensable in any reflection on sustainable development.

3 The spatial axis (space). With the appearance of global changes of a climatic nature - such as the greenhouse effect, the destruction of the ozone layer, acid precipitation - the scale of concerns has extended to the troposphere and the atmosphere. The spatial range thus goes from the village land to the atmospheric layers.

4 The axiological axis (values). The environment in its global sense implies taking into account man and his needs as well as the dynamic interactions between men and the biosphere; it is therefore necessary to involve, in addition to knowledge, values such as the responsibility of each person in the rational management of resources and the solidarity of men among themselves; the values linked to freedom and human rights are fundamental.

5 The systemic axis (system). The environment, as a system, is dependent on the concepts and laws that characterize any system: totality and emergence, interactions, organization (structure and functioning), complexity, dynamism, evolution. The system must also maintain itself, ensure its dynamic stability, its regulation.