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PEDAGOGICAL HANDOUT

Title

ENVIRONMENTAL LAW & ECONOMICS

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Human activities have evolved considerably over the last century, particularly since the Second World War. Population growth, technological progress, industrialization, agricultural expansion at all levels …etc, have been the driving force behind a mode of development that has had a major impact on the natural environment.

Today, the world is faced with environmental challenges at all levels, micro, meso and macro. The major challenges we face are enormous.

The most high-profile of these challenges is climate change, the subject of an annual conference of the contracting parties to the United Nations Framework Convention on Climate Change.

The challenges posed by the sharp decline in biological diversity are just as major, even if in some ways they are often less recognized by the general public. There is an urgent need for considerable investment in preserving biodiversity in the broadest sense of the term.

Water, essential to life, is today an increasingly scarce resource, but this scarcity is distributed inequitably across the planet, with dramatic consequences in certain regions and creating more and more conflicts over use and access.

Atmospheric and noise pollution associated with urban development and the use of various means of transport are at the heart of a public health and living conditions issue that needs to be improved. New pollution-related diseases are appearing and progressing in urban environments.

This pollution phenomenon is exacerbated when combined with another phenomenon of no lesser importance: waste. Production and consumption patterns generate household, industrial, solid and liquid waste. Despite increasingly costly treatment solutions for local authorities, the problem of waste management remains a recurring one.

Beyond these major challenges, there are others that affect the daily lives of millions of people.

Poverty, security, access to energy, health... are all issues to be taken into account in sustainable development strategies, a process that aims to change the way we look at the environment and nature, and the way we produce and consume **[1]**.

I. Environmental economics

Environmental economics is a branch of economics that deals from a theoretical point of view with the economic relations between human societies and the environment [2]. The etymology of the term economy (from oikos, the house, and nomos, the rule) reflects a desire for efficient management of the house, i.e. the habitat in the biosphere, and refers to that of ecology (from oikos, the house, and logos, the study). The aim is to create an environmental economy, just as we have created the economy of other fields, by economically analyzing something that has recently entered the field of scarcity and is called "environment".

It is a neighbouring field, but distinct from ecological economics (which studies the interdependence between human societies and ecosystems in time and space), which considers nature from a different angle to economics, but which enriches and complements it. These two disciplines offer tools for analyzing human behavior in the face of resource scarcity **[1]**.

- How did this concept come about?

From the greenhouse effect to pollution in its many forms, the environmental issue has now completely taken over the field of economics. This cultural revolution began in the 1970s with the rise in ecological awareness that followed the media coverage of the first major pollution incidents.

Economists had long conceived of the environment as a stock of resources, whether exhaustible (metals, fossil fuels, etc.) or renewable (water, air, biodiversity, etc.).

- The aim of environmental economics

It is in this particular perspective of the evolution of the culture of the species that the expression, which some would describe as an oxymoron or even an absurdity, was coined: environmental economics. Its aim is to integrate the ecological values of the environment into the specific framework of economics and, more specifically, the economic and social sciences. What neoclassical economists had dismissed from their field of vision (welfare economics and public economics), probably unconsciously, environmental economics seeks to include.

Environmental economics is the search for a new, real efficiency that integrates the interactions between stakeholders and between human interventions and the environment (in the broadest sense). This new orientation is not exclusive of the old economic vision: on the contrary, the aim is to build an edifice with the traditional economy that takes ecological value and environmental variables into account **[3]**.

1. Economic systems and the naturel environment

1.1. The economy and natural resources

From an economic point of view - that which concerns the production, distribution and consumption of goods and services to satisfy human needs and desires - we can see the role of productive resources that these natural environments can play. Man, through and in his economic activities, will use these natural environments.

In its activity of creating goods, it takes energy, mineral and organic materials and transforms them. But at the same time, it also produces waste, which it recycles or discharges into the environment.

In short, the term "**natural resources**" implies that "*nature works for man*", i.e. that it provides him, free of charge (without human labor), with a certain number of riches in significant quantities, which can be used either directly (landscapes, places to swim, walk...), or indirectly after a more or less long transformation by man, in the form of energy, raw materials or physical-chemical processes (photosynthesis).

Among these natural resources, we traditionally distinguish those that renew themselves rapidly without human intervention, known as **renewable resources**. These do not require any particular management, as in the case of oxygen, wood cuttings, sea water or sunlight.

Other natural resources are irreversibly extracted, i.e. their stocks are globally limited and diminish with the flow of withdrawals, i.e. they are **non-renewable** (such as ores and fossil fuels) or have a very slow rate of renewal, which complicates their management.

In any case, while the economic exploitation of these natural resources is fundamental and advantageous for mankind, it can also lead to over-exploitation through excessive harvesting (forest over-exploitation beyond the natural growth rate or without replanting what has been harvested, leading to massive deforestation as in India, China or South-East Asia) or too rapid harvesting (in the case of a non-renewable resource, this does not allow sufficient time for a new technology to take over).

In addition to these non-renewable resources, there is also the excessive use of more or less virgin land for urban development, industry, agriculture and tourism.

1.2. Economic systems

In any economy, people organize themselves to produce, consume, market, save and distribute wealth. The economic system is a theoretical model for the economic and social organization of a state. After the Second World War, two economic models emerged as a result of profound changes in the political, economic, social, cultural and industrial spheres. These two systems are capitalism and socialism. They are two opposing systems with ideologies and principles that are, in most cases, contradictory.

1.2.1. The capitalist economic system

The capitalist spirit stems from the 18th century, a period of exalted liberalism and individualism. Philosophers such as Voltaire and Jean-Jacques Rousseau supported this thinking, calling for freedom of political and economic expression. In its purest form, the capitalist system is based on individualistic appropriation and competition.

A. The foundations of the capitalist economy

- Private ownership of the means of production

In a capitalist economy, all the means of production are, in principle, privately owned. In legal terms, this private ownership manifests itself in the right to individual property. Indeed, the capitalist regime exists when individuals have the right to own and freely dispose of production goods and the fruits of their use.

- Free competition

Free concurrence is competition or rivalry between companies with the same objective and seeking the same advantages. It is reflected in the increasing liberalization of markets. Here, each company is free to sell on whatever terms it chooses, i.e. to use whatever means it deems best to attract customers, including those of its rivals.

The aim is always to offer the best quality products at the best price. But this free concurrence leads to the concentration of companies and the elimination of the weakest to the benefit of the strongest. Cartels are born to control an entire market. These large

production units are dangerous, as they create economic monopolies, destabilize states, exploit workers and manipulate customer desires through sometimes misleading advertising.

B. The disadvantages of capitalism

For this system, everything tends to become a commodity, even people (buying organs, selling children, etc.). Business is found in knowledge, scientific research and artistic works. Money is valued more than people **[4]**.

1.2.2. The socialist economic system

Karl Marx and Friedrich Engels consider that man was originally socialist, since people lived in homogeneous groups, hunting and cultivating collectively - a form of *primitive socialism* (hunter-gatherer man). The two authors in question are against capitalism and criticize it severely, seeing it as a form of social injustice in which man exploits man insofar as the rich have the capital (capitalist bourgeoisie). These rich exploit the working poor, who do not own the capital (proletariat) and have only their labor to offer. In short, the socialist system ensures equity in the distribution of wealth and the abolition of social classes.

A. The foundations of socialism

Socialism was born of a challenge to the excesses of economic liberalism. The word first appeared in 1830, advocating the destruction of the bourgeois state and the establishment of an egalitarian society.

Socialism is based on collective ownership of the means of production and exchange, with the state owning the roads, factories and large agricultural areas. It controls the banks and the market: we speak of state dirigisme. In contrast to the capitalist regime, the economy is planned, which means that objectives are set for a given period of time, that the economy does not go astray, and that goods and services are provided in accordance with society's needs. The state is interventionist (setting product purchase prices and employee wages), and resorts to nationalization and protectionism. In this system, work is both a right and a duty.

B. The advantages and disadvantages of socialism

The fundamental values of socialism include the fight against social inequality, social justice, equality of opportunity and the fair distribution of resources. Socialism advocates an egalitarian society that fights individualism and gives precedence to the general interest over particular interests. In short, this system values human beings over money.

But socialism is not conducive to rapid social development, due to the absence of competition and the lack of freedom of initiative. It is a system regularly faced with shortages of consumer goods, leading to the existence of a black market that escapes state control **[4]**.

1.3. Sustainable development

If we had known for a very long time that human activities could have a serious impact on the various natural environments essential to survival, and threatened to deprive future generations of the quality of life to which our own generation has become accustomed, we might have chosen more sustainable methods to improve our well-being. The fact that we didn't have this knowledge and therefore couldn't make informed choices years ago explains why today's generations are facing more difficult decisions and have fewer and fewer options.

The level of economic activity grew steadily, while the extent of the environmental problems generated by this activity crossed geographical and generational frontiers.

Each generation has also become accustomed to the comfort of meeting its own needs without concern for those of future generations, and this is no longer the case today either. International cooperation is essential if we are to solve the problems of climate change, the disappearance of biodiversity and so on. Future generations can't defend themselves, so today's generations must take the lead. Today's policies must take account of our obligations to future generations, whatever the difficulties or imperfections of including them.

This need for international and intergenerational cooperation took on institutionalized by Gro Harlem Brundtland in her report of the same name.

The Brundtland Report, officially entitled Our Common Future, was published in 1987 by the United Nations World Commission on Environment and Development, chaired by Norway's Gro Harlem Brundtland. This work provided an official definition of sustainable

development. But it was also used as a basis for the 1992 Earth Summit to make a commitment to the planet and to sustainable development. The report defines the concept as follows: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." **[5].**

The definition of sustainable development revolves around three axes, which give sustainable development a multidimensional character:

- **An economic dimension:** this involves optimizing growth variables (investment, productivity, etc.) while avoiding passing on a burden of debt to future generations.
- **A social dimension:** (intragenerational equity) aimed at combating exclusion and poverty, and meeting essential needs.
- **An environmental dimension:** aimed at preserving natural resources for future generations.

Figure 01: The three pillars of sustainable development

1.3.1. The Sustainable Development Goals The 17 Sustainable Development Goals (SDGs) are general, universal objectives for all UN (United Nations) member countries, which were adopted in September 2015. They form the keystone of the Agenda 2030. They take equal account of the economic, social and environmental dimensions of sustainable development. The goals oblige states, not just developing countries, to end poverty, achieve gender parity, improve health and education, make cities sustainable, combat climate change, protect forests and much more.

Figure 02: The 17 sustainable development goals..

1- No poverty**:** end poverty in all its forms everywhere.

2- Zero Hunger: end hunger, achieve food security and improved nutrition and promote sustainable agriculture.

3- Good health and well-being: ensure healthy lives and promote well-being for all at all ages.

4- Quality education: ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

5- Gender equality: achieve gender equality and empower all women and girls.

6- Clean water and sanitation: ensure availability and sustainable management of water and sanitation for all.

7- Affordable and clean energy: ensure access to affordable, reliable, sustainable and modern energy for all.

8- Decent work and economic growth: promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

9- Industry, innovation and infrastructure: build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

10- Reduced inequalities: reduce inequalities within and among countries.

11- Sustainable cities and communities: make cities and human settlements inclusive, safe, resilient and sustainable.

12- Responsible consumption and production: ensure sustainable consumption and production patterns.

13- Climate action: take urgent action to combat climate change and its impacts.

14- Life below water: conserve and sustainably use the oceans, seas and marine resources for sustainable development.

15- Life on land: protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

16- Peace, justice and strong institutions: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

17- Partnerships for the goals: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

1.3.2. The principles of sustainable development

The notion of sustainable development is based on a number of principles that have been expressed at all the summits and international conferences mentioned above. These principles are as follows:

1.3.2.1. Precautionary principle

This principle is primarily a matter for the public authorities, and is applied in specific situations to deal with major risks. It stipulates that we should not wait for a natural disaster or major pollution to occur before dealing with environmental risks.

Effective measures must be taken with a view to prevention, and not in response to a crisis: the absence of certainty does not therefore justify the passivity of public policies. It concerns situations that present a potential risk of serious or irreversible damage, often in the absence of proven scientific knowledge on the subject.

- Legal foundations

The fifteenth principle of the Rio Declaration makes this concept explicit: "To protect the environment, precautionary measures should be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Examples

It is on the basis of the precautionary principle that health authorities in France recommend that people use a pedestrian kit to keep cell phones away from sensitive areas of the body, make calls in well-served areas, keep phones away from sleeping areas, and so on.

Even if the scientific data currently available do not justify restrictive regulatory measures, they are sufficient to encourage caution. In the absence of proven results on the effects of radiofrequencies, the aim is to limit public exposure and avoid serious, irreversible health impacts in the future.

1.3.2.2. Principle of prevention and correction

This is a legal mechanism whose role is to find the best solutions for repairing damage to the environment, at a respectable economic cost. It applies to any known risk situation involving foreseeable damage.

Prevention is one of the preferred means of public action, particularly in the fields of the environment, health, road safety and social action.

For example, one of the public policies pursued by the Ministry of the Environment concerns the prevention of natural and technological risks. The principle of prevention also concerns each and every one of us on a daily basis, particularly when we act prudently to avoid a domestic accident or for health reasons.

In addition, prohibitions (e.g. banning the discharge of waste and polluting substances into the environment) and incentives (e.g. encouraging the selective collection of waste, encouraging the purchase of less polluting vehicles, etc.) have been introduced into regulations to prevent various forms of pollution.

- Legal foundations

Although this principle is not explicitly set out in the Rio Declaration, it is implicit in the fact that "*States must enact effective environmental measures*".

Example: environmental protection law, water law. Don't confuse prevention with precaution!

On the one hand, prevention concerns situations where there is a proven risk of foreseeable damage. On the other hand, precaution concerns situations of potentially serious and irreversible risk for which scientific evidence is not necessarily available.

1.3.2.3. The principle of participation and the right to information

The principle of participation invites all citizens to contribute to the preservation of natural environments and biodiversity. According to this principle, everyone must have access to information and data relating to chemical, nuclear or biological risks, and to dangerous activities in general.

Indeed, sustainable development requires the participation of all social, political and economic partners in projects. Citizens, as well as project managers and governments, must be involved to ensure the success of sustainable projects.

Councils need to be set up to convince and raise awareness among citizens of the importance of such projects for society and the future.

- Legal foundations

The tenth principle of the Rio Declaration sets out the right to information as a means of encouraging citizen participation in decision-making processes concerning collective life.

"*The best way to deal with environmental issues is to ensure the participation of all concerned citizens, at the appropriate level. At the national level, every individual must have due access to environmental information held by public authorities, including information on hazardous substances and activities in their communities, and have the opportunity to participate in decision-making processes. States must facilitate and encourage public awareness and* ***participation*** *by making* ***information*** *available to the public*."

Example:

Public inquiries, which are open to the public for projects that may have an impact on the environment, by requiring project owners of a road project, a major structure or a development to carry out an impact study and make it known to the public through a public inquiry procedure organized to encourage citizen participation.

1.3.2.4. Principle of solidarity

Solidarity and the sharing of the Earth's resources is a fundamental principle of sustainable development. Countries must share raw materials equitably among themselves, leaving some for future generations. Solidarity must exist between states, particularly between industrialized and developing countries, as well as between

generations. The raw materials economy is therefore a necessity if this principle is to be respected.

1.3.2.5. The principle of responsibility

Responsibility, in the common sense, is the fact that each person is legally or morally accountable for his or her actions and decisions, and must accept the consequences.

For a nation, responsibility can also mean a moral duty in the face of a historical situation that requires reparation, or for a company director, the obligations associated with his or her duties.

- Legal foundations

The seventh and thirteenth principles of the Rio Declaration (Earth Summit-1992) introduced the notion of the environmental responsibility of developed countries: "Developed countries recognize their responsibility in the international effort towards sustainable development, taking into account the pressures their societies exert on the global environment and the technology and financial resources at their disposal.

Examples

Extract from an article in Economics Alternatives: "For the first time in France, a court has recognized ecological damage. This legal principle was established at the Erika trial last January: four parties involved in the sinking of the tanker, including Total, were ordered to pay substantial fines for maritime pollution".

1.3.2.6. Principle of ethics

The principle of equity is one of the principles defining the concept of sustainable development. It was introduced at the Rio de Janeiro Conference, preceded by the Brundtland Commission which, in its report, proposed the very famous definition of sustainable development: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

The principle of equity is implicit in this definition and is expressed in two ways in relation to time and space:

- Future-oriented intergenerational equity, which encompasses the rights and duties that each generation has towards future generations, in particular the moral right to preserve the planet's natural and cultural resources.

• Intragenerational equity in its spatial dimension concerns the satisfaction of the needs of current generations, which implies solidarity between the richest and the poorest and the preservation by man of other species and the environment.

- Legal foundations

The third principle of the Rio Declaration states: "*The right to development should be realized in a manner which equitably meets the developmental and environmental needs of present and future generations*".

One concrete example of international "solidarity" action is to "halve the proportion of the world's population without access to safe drinking water and sanitation by 2020.

1.3.2.7. Polluter pays principle

This is a tool for combating pollution and the various pressures that man puts on the environment. This principle is basically an economic concept. It aims to ensure that economic players take account of the "external" costs to society of the damage caused by their activities. This principle concerns public and private activities, companies, households and each and every one of us.

This principle aims to achieve:

- Efficiency: so that prices reflect the full reality of production costs and, in the long term, economically favor the least polluting activities,
- Fairness: in the absence of fairness, the taxpayer, who is not necessarily the user or consumer of the services or goods produced, ends up footing the bill in terms of tax,
- Responsibility: identifying the polluter and the price to be paid should encourage them to minimize the pollution produced.

- Legal foundations

The sixteenth principle of the Rio Declaration introduces the notion of the polluter paying: "*National authorities should endeavor to promote the internalization of environmental protection costs and the use of economic instruments, in accordance with the principle that the polluter should, in principle, bear the cost of pollution*".

The polluter pays principle was adopted by the OECD [Organization for Economic Co-operation and Development] in 1972, with the aim of including the costs of combating

pollution in the costs of services and products. This principle is one of the key principles underpinning environmental policies in developed countries.

Examples

The polluter pays principle is applied in France, for example, with the system set up by ECOEPACKINGS.

1.4. The dominant economic system and sustainable development

The dominant economic system generates and exacerbates a multitude of ecological and social problems, and the transition to a sustainable development model implies moving towards a new economic model.

The notion of sustainable development has become an established part of the institutional, media, scientific and business landscape. You only have to visit the websites of major companies to see how sustainable development has become an integral part of institutional communications. The very expression "sustainable development" has become an essential part of the legitimacy of all economic and political action, and everything becomes a pretext for emphasizing the coherence between sustainable development and one's own activities, as well as the efforts made to increase this coherence.

In reaction to the appropriation of the notion of sustainable development by the players at the heart of the dominant economic system, a number of players are particularly sensitive to the ecological issue. The most virulent opponents are undoubtedly those who oppose capitalism. If we follow Paul Ariès (2005), sustainable development in the context of our society would be unthinkable because it would not involve calling capitalism into question. In fact, sustainable development is criticized for being a concept which, far from calling into question the behavior of the players in the dominant capitalist system, on the contrary supports its movement and reinforces its legitimacy.

The challenges of sustainable development essentially fall into the two broad categories of environmental imbalances and social inequalities. These imbalances and inequalities have their common source in a system with a globalizing tendency.

This system is characterized by the institutional operation of market capitalism, which benefits from its alliance with the massive industrialization of human activities, a boom largely made possible by advances in the life sciences, chemistry and physics. For a time, we might have thought that there would be abundance for everyone, but that was without

taking into account the fact that this abundance was nothing more than the intense exploitation of non-renewable resources and a prodigious acceleration in the entropy of the biosphere. Abundance could only be short-lived, or would eventually affect only a tiny minority **[6]**. Yet, as Albert Einstein put it, "you can't solve a problem with the same way of thinking that created it".

In a capitalist world, sustainable development, like any other concept in human ideology, has its limits and can pose certain risks and difficulties in its application. The first risk is that industrialized countries will restrict industrial development in developing countries, a protectionist policy pursued by some countries for fear of competition. Another risk is linked to sustainable tourism: in order to preserve certain natural sites, they are increasing access fees, which mean that only rich people have the chance to visit, and this contradicts the principles of sustainable development, which call for social equality. There are many risks associated with this concept (access to information, sharing of technologies, scientific solutions, etc.) **[6]**.

1.4.1. The market economy: the dominant economic model

Generally speaking, the global economic system can be described as a "market economy". Broadly speaking, a market economy is an economic system in which decisions (to sell, to buy, to produce, to consume) are taken on the basis of the confrontation of supply and demand in a market where the players are free. In a market economy, players (companies, individuals, etc.) produce goods and consumers buy them. The prices of these goods (but also the value of money, wages, etc.) are determined by the law of supply and demand: in short, the more a good is in demand, the more it costs.

In theory, in a market economy, the system is self-equilibrating because individuals make rational, utilitarian decisions (this is known as the general equilibrium model). If a producer sells a good at too high a price, nobody will buy it (demand falls) and the producer, being rational, will be obliged to adjust his behavior (lower his price) in order to sell again. Again in theory, this system produces an optimal economic situation insofar as the decisions of the players are rational. It is in everyone's interest to work (to earn money), to produce something useful (that people will buy), at a reasonable price,

everyone works and benefits from the work of others... In short, everyone wins. But for that to happen, each individual has to be free to make his or her own decisions: there has to be free competition, free movement, free trade... **[7].**

- Why is the market economy struggling to take ecology into account? Why don't economic and political players attach more importance to environmental issues? The reason may lie in the very structure of our market.

Ecology is now universally recognized as a political priority. At every election, virtually every candidate claims to have an ecological stance and claims to be putting in place a policy that is supposed to combat global warming, limit the degradation of ecosystems, preserve natural resources or biodiversity.

Yet the reality is that things are not moving forward. Every year, global CO2 emissions continue to rise, and little progress is being made in reducing waste or preserving biodiversity. Sustainable transport remains marginal, and the commitment of companies through their CSR policies (CSR refers to the voluntary contribution of companies to the challenges of sustainable development) is far from sufficient: in short, we have the impression of stagnating. Even people who think they're "green" find it hard to act when it comes to consuming more responsibly or abandoning certain polluting practices **[7]**.

1.4.2. The spread of the market economy and the problem of ecology

This system, based on the ideas of liberal economists from the 18th and 19th centuries onwards, was adopted almost everywhere in the world. Gradually, most of the world's countries (led by Europe) lowered their customs barriers, liberalized their economies and gave greater freedom to businesses and entrepreneurs, on the assumption that maximizing economic output in this way would maximize overall well-being.

And it has worked rather well. There is no doubt that the generalization of the liberal economy has produced a great deal of economic wealth. It has contributed to the major development of mankind over the last two centuries, and has helped to bring about numerous innovations in a wide range of fields. Industry and agriculture have been modernized, and this has made it possible to feed and meet the needs of an ever-increasing number of people, and to reduce poverty and hunger in the world...

But it has also, incidentally, had negative consequences for the environment (among other things): pollution, global warming, loss of biodiversity. We've known since at least the 1980s that these issues will call into question the ability of our economic systems to produce, or even to survive. And yet we are continuing along the same path. Not very 'balanced' or 'rational', is it? It's as if, for 40 years, the economic system had been incapable of taking ecological constraints into account and adapting to them, even though the ability to adapt is, in theory, the very point of a market economy.

In fact, it seems that the market economy regulates itself well only when it comes to short-term adjustments such as prices, interest rates or wages. For example, if there is a lot of money in circulation and comparatively few players prepared to borrow to invest in projects, then interest rates fall. The same goes for prices and wages. In short: anything that represents a quantifiable cost generally adjusts fairly well in a market economy.

But the market economy seems to have trouble taking longer-term issues into account, especially when they are non-monetary, such as ecology. Let's take an example. CO2 emissions are on the rise, and we know that they are deregulating the climate to the point of endangering our societies, yet all the economic players continue to increase their CO2 emissions year on year, by consuming fossil fuels. At first sight, it doesn't seem very rational. And yet, in a market economy, it makes sense **[7]**.

1.4.3. The problem of taking ecological issues into account in the market economy

Firstly, because in reality, individuals are never 100% rational. We see this very clearly in everyday life: a person who wants to lose weight to preserve their health may still fall for a tiramisu at the end of a meal that is already full, when rationally they should be doing without. But it's quite logical: as easy as it is to make a rational assessment of a phenomenon that affects us immediately (like burning yourself when you touch a hot pan), it becomes more complicated when we're talking about diffuse phenomena that take place over a long period of time. A tiramisu doesn't make you put on weight, it's the repetition of the action over time that ultimately causes the problem. And it's the same for environmental problems: 1 ton of CO_2 in the atmosphere doesn't change anything; it's the accumulation of CO_2 that creates the problem. The incentive to act rationally is therefore less obvious because the problem itself is less clearly perceived. These biases in decision-making are a fundamental research theme in behavioral economics.

On the other hand, in a market economy, economic players are subject to cost logic. As we have seen, what creates adjustments in a market economy are prices (and therefore costs). The data on which players base their choices are therefore essentially monetary: how much does my labor cost, how much do my resources cost, at what price can I sell, what is my profit, etc. So obviously, as the ecological crisis is not costing these economic players (businesses, consumers, etc.) anything, at least for the time being, it is not affecting their capacities or their profits. Once again, there is little incentive to change behavior. And it's even worse than that. Very often, adopting environmentally-friendly behavior represents a cost (at least initially). For example, choosing high-quality, sustainably-grown raw materials is often more expensive for food companies. The long-term collective interest (ecology) is therefore at odds with the short-term financial (and sometimes social) interest **[7]**.

2. The economic causes of environmental problems

The biosphere on which humanity depends is being modified to an unprecedented degree... The pressures exerted by human activities on nature have increased considerably over the last fifty years. The socio-economic system has impacts on the environment by extracting resources and emitting waste, which altering it in a more or less irreversible way. In turn, the weakened environment alters the socio-economic system.

Environmental problems such as climate change, desertification, loss of biodiversity, deforestation, destruction of the ozone layer, air, water and soil pollution, hazardous and plastic waste, pollution of the seas and oceans pose a threat to human safety, health and productivity, the survival of other living species, food security and water resources.

2.1. Environmental externalities

2.1.1. Definition of externalities

One of the main causes of environmental degradation is the existence of external environmental costs. Since many environmental resources are freely available and considered a public good by economic agents, there is little incentive for them to take full account of the costs of environmental degradation. However, these costs will tend to increase over time, as resources degrade or become depleted and therefore scarcer **[8]**.

This is precisely the case when we ignore the special dimension of the environment: these are **external effects**, also known as **externalities**.

Economist's use the term "externality" to describe the fact that the production or consumption activity of one agent affects the well-being of another, without either of them receiving or paying compensation for this effect **[3]**.

2.1.2. Types of externalities

Depending on their economic effects and impact on well-being, there are two types of externality:

A) Positive externalities that improve the well-being of agents. In other words, they refer to situations where an actor is favored by the actions of third parties without having to pay. The founding example is that of the arborist and the beekeeper. The beekeeper's bees pollinate the arborist's trees, which produce fruit, and the arborist's trees feed the bees with nectar and pollen. This is an unintended cross-benefit between the two activities, or the establishment of one activity in the vicinity of another that benefits from the effects induced by this new proximity (construction of equipment or transport infrastructures).

B) Negative externalities: which may have a negative value by reducing well-being without financial compensation.

Example: residents living near an airport: they suffer from noise pollution and a fall in the market value of their property if the airport records a growth in traffic which generates additional operating income).

Another example is that of firm **A**, which uses a river as a vector for its pollutant discharges, thereby making other uses of the water impossible for firm **B**, located downstream of firm A (laundry and fish farming). In this way, firm A's production activity has harmful consequences for firm B's activity (loss of competitiveness, additional costs), but no financial compensation is paid from firm A to firm B **[3]**.

Among all the negative externalities, several distinctions can be made:

- **Depending on their source, we distinguish** :

Consumption externalities caused by the consumption of certain goods (tobacco, noise, polluting waste, etc.).

Production externalities caused by the productive activity of companies (emission of polluting gases such as sulphur, nitrate pollution of soil and watercourses, etc.).

Bilateral externalities are those resulting from the action of one agent on the well-being of a single other agent. However, externalities are most often caused by the action of several agents (air pollution) and/or affect a large number of agents.
Diffuse externalities, when the source of the externality is not identifiable, which is the case in many global pollution situations.

- **Depending on their influence on the economy, we distinguish :**

Transferable externalities: in certain cases, an agent who suffers an externality can pass it on to other agents (waste can be transferred from one country to another).
Static externalities: These are those that have a reversible effect on the well-being of agents and can be dealt with by agreements between contemporary economic agents.
Dynamic externalities: which have persistent effects on the economy and cannot be offset by the same methods (greenhouse gas emissions) **[3]**.

Not all involuntary actions by one agent on another are sources of externalities, and those that pass through a market and prices are excluded. In a market, the quantities demanded by one agent will have an effect on the price and on the other agents, but this is not an externality. The word externality refers to effects external to the market. An externality therefore exists when the actions of one agent influence the well-being of another agent, without this action passing through a market.

2.1.3. Externalities and the environmental commons

The case of an externality produced by one agent affecting another agent is quite conceivable, but remains relatively rare. In general, many agents are affected by the externality, and in the same way pollution is frequently the product of the activities of many agents. Symmetrically, the services provided by natural resources often benefit many agents, while these natural resources can be threatened by many activities.
So the pollution caused by transport is an externality produced by many agents and also suffered by a large population, which includes a large proportion of those who produce it. Biodiversity is a natural resource that is threatened by many causes and may prove important for various agents, in particular for agents that are not yet born, for future generations. Finally, carbon dioxide is produced by the combustion of fossil fuels or the

destruction of biomass. It is emitted during the production or consumption of virtually all goods, and its accumulation is certainly responsible for a change in the earth's climate that affects all living beings **[9]**.

2.2. Economic growth, the environment and well-being

For Adam Smith, The Wealth of Nations was about the accumulation of wealth through a better organization (and therefore a better understanding) of individual interests. According to the article by (Brechet, 2009), however, economic analysis has gradually come to realize that Adam Smith overlooked two things.

On the one hand, it neglected the environmental factor, i.e. the exploitation of the environment and natural resources, and their contribution to this accumulation of wealth. Improved well-being depends on the accumulation of wealth to eradicate poverty, disease and war. But does this accumulation have to come at the cost of environmental degradation? What's the point of accumulating wealth if you're going to die drowning, contaminated or suffocated? People's well-being also depends on the quality of their environment. Reduce access to health infrastructure in your country and you will have thousands of deaths. Take away drinking water, and you'll soon have nobody left. The quality of the environment is therefore an important factor in human well-being, and sometimes even an indispensable condition, which is why the environment is an economic problem.

On the other hand, Adam Smith was unaware of the notion of externality, which is fundamental to environmental economics **[10]**.

2.3. A paradox between environmental and social issues in emerging countries

There is a paradox within emerging economies between economic development and environmental protection. While public policies in developed economies must respond to society's growing expectations in terms of environmental sustainability, emerging economies must also face ever greater challenges linked to rapid economic development, urbanization and increased demand for energy and natural resources.

In emerging economies, strong economic pressure and limited or difficult-to-enforce regulations are leading to major problems. For example, air pollution in cities in emerging

countries has risen sharply in recent years (carbon dioxide emissions rose by more than 50% between 1990 and 2012) **[11]**.

2.4. Some examples of the consequences of increased economic activity in emerging countries.

- It is often a major factor leading to increased exploitation of natural resources in emerging markets. Extractive and GHG-intensive industries (mining, gas, coal, and forestry) are often key sectors in the economies of these countries.
- Economic pressures can also lead to an intensification of agricultural production, which can lead to the degradation of soils and ecosystems.
- Polluting industries such as mining and manufacturing are expanding rapidly to meet growing consumer and business demand.
- Around 70% of the world's freshwater resources are used for agriculture. Much of this use is concentrated in developing countries.

Brazil, for example, has experienced strong economic growth in recent decades (average annual growth rate of around 4.8% over the period 1960-2000 and 2.2% over the period 2000-2021), largely due to the expansion of agriculture, livestock farming and mining. However, this economic growth has had disastrous consequences massive deforestation of the Amazon, the world's largest tropical rainforest. This deforestation has had a negative impact on biodiversity, the climate and the local communities that depend on the forest for their livelihoods. Mining has also had a negative impact on the Brazilian environment, notably by polluting rivers and degrading natural habitats. Mining waste spills, such as the one that occurred in 2019 in the state of Minas Gerais, have had a catastrophic impact on ecosystems and local communities.

Finally, the expansion of livestock farming, particularly cattle farming, is now the main cause of deforestation in the Brazilian Amazon (Brumadinho accident, collapse of a mining dam on 25 January 2019) **[11]**.

3. Economic analysis of pollution

Economic analysis integrates pollution and environmental degradation through the concept of externality, already discussed in the previous paragraphs.

3.1 Internalizing externalities

The internalization of net external environmental costs is the objective that must be pursued.

The aim of internalization is to make a designated economic agent bear the cost of achieving an environmental objective.

The existence of an externality is a market failure that may be corrected by government intervention. In this case, a government can intervene in two ways: **it can adopt an authoritarian attitude** by imposing rules on the parties; it can **encourage the adoption of contractual solutions** that will encourage private decision-makers to solve the problem themselves.

If he chooses an **authoritarian attitude**, the government can make a particular behavior compulsory or, on the contrary, prohibit it. For example, it is forbidden to dump toxic chemicals into water supplies. In this particular case, the external costs to society are infinitely greater than the benefits to the polluter, so the government simply prohibits such behavior. Unfortunately, in most cases, things aren't quite that simple.

> Ecologists notwithstanding, it is impossible to eliminate all polluting behavior unless we ourselves are eliminated. Limiting nuclear power means using oil or coal more intensively, whose pollution is just as fearsome. Doing away with oil or coal would mean going back to using horses, whose excrement is just as unhealthy. And it would be ridiculous to want to ban all forms of transport. Not only would such a measure stifle the economy, throwing millions of people out of work, but it would go against the fundamental right to freedom of movement. Of course, the unemployed would live - survive? - In a healthy environment... **[12]**

Rather than trying to eliminate all forms of pollution, it is better to measure its costs and benefits in order to decide what type and amount of pollution is acceptable.

In the same context, that of the authoritarian altitude and in order to respond to the problem of externalities and therefore to market failures, environmental economists have opposed two philosophies of intervention **[12]**.

3.1.1. ***The first is the regulatory or administrative approach, which covers***

a) Bans and requests for legal authorization:

These are used by the public authorities to restrict access to the market for certain products with a view to protecting the environment and public health (the famous **precautionary principle**). This philosophy is largely based on decrees, laws or European directives.

b) Regulations: these cover all standards, whether relating to environmental quality, effluent emissions, technical processes to be adopted or products to be manufactured.

3.1.2. ***The second is the economic approach****, which consists of using market mechanisms by modifying a relative price and provoking a financial transfer*. Economic instruments use market mechanisms to encourage producers and consumers to limit pollution and prevent the degradation of natural resources. Their logic is simple: the aim is to raise the cost of polluting behavior while allowing producers or consumers the flexibility to find their own strategies for controlling production at the lowest cost. Economic instruments are generally classified into four categories.

c) Taxes and charges: price regulation (taxes or subsidies)

In 1920, the economist Arthur Cecil PIGOU (1877-1959) was the first to propose the introduction of a tax to internalize negative externalities.

Imagine two factories - a steelworks and a chemical plant - each discharging 500 tons of toxic waste a year into the nearby river. The government, which wants to reduce the level of pollution, is considering two solutions:

Solution 1) Regulate: each factory is given a threshold, for example a maximum of 300 tons of waste per year;

Solution 2) Pigovian tax: factories will have to pay 50,000 euros in tax per ton of waste dumped.

Regulations are designed to set a pollution level, while **the tax** is designed to encourage industrial operators to reduce pollution levels. It is perfectly possible that the steelworks could reduce its pollution at a lower cost than the chemical plant. If this is the case, the steelworks will substantially reduce its level of pollution so as not to pay too much tax,

while the chemical plant will reduce its level of pollution less and pay more tax. In practice, the Pigovian tax amounts to setting a price for pollution permit **[12]**.

This is the "polluter pays" principle: the polluting company is properly informed about the true social costs of its activity. With this tax on each unit of pollution emitted, its production cost is now higher.

Following Pigou's work, environmental economists were led to distinguish between several types of tax **[3].**

- *Charges or taxes on emissions* are levied directly on the quantity or quality of pollutants released. Such as air pollution (in France, charges have been introduced on sulphur oxide emissions; in Sweden, they target nitrogen oxide emissions), noise (charges on aircraft noise) or waste discharges (although they only target industrial waste).
- *User charges* cover the cost of collection and treatment services, and are often used by local authorities for the collection and treatment of solid waste and wastewater. Their main purpose is to generate revenue.
- *Charges or taxes on products* target polluting products at the manufacturing, consumption or disposal stage. Examples include taxes on fertilizers, pesticides and batteries, the main ones being eco-taxes on energy (taxes on the carbon and sulphur content of fuels). The purpose of these taxes is to change the relative prices of products or to finance collection and treatment systems **[3]**.

d) Negotiable pollution permits

In the case of pollution permits, polluting companies buy permits from clean companies. Specifically, the government determines the overall quantity of pollution that is acceptable by issuing a limited number of pollution permits - this constitutes the supply - and the meeting of demand determines the price of pollution borne by the polluting companies.

Let's imagine that the government decides to impose the regulatory procedure, obliging the two companies to limit their toxic waste to 300 tons per year. The representatives of the two companies meet the relevant government officials with the following proposals: the chemical plant needs to increase its toxic emissions by 100 tons; the steel plant is prepared to reduce its emissions by the same amount if the chemical plant pays it €5,000,000. From an economic point of view, this operation is interesting. Since it is a voluntary agreement between the two companies, they each benefit from it. The

agreement does not harm any third party, since the overall level of pollution remains unchanged. Social well-being is therefore increased if the steelworks sells its pollution permit to the chemical plant.

By authorizing this type of contract, the government will have created a new market: that of "pollution permits". Companies that find it difficult to reduce their pollution levels will be prepared to pay a high price for these permits; they will agree to pay for them as long as the price is lower than the costs they would have incurred to reduce their pollution levels. On the other hand, companies that are able to reduce their pollution levels at a lower cost will sell their permits.

While environmental movements are indignant about the very notion of pollution permits, arguing that you can't sell anyone the right to pollute the environment, they have to admit that, in the absence of such mechanisms, companies will continue to pollute for free. An effective ecological policy must recognize one of the fundamental principles of economic analysis, which is that people have to make choices. Clean air and clean water have value, but that value must be weighed against their opportunity cost - that is, what must be given up to obtain them **[12].**

e) Deposit systems

These systems are widely used in OECD (Organisation for Economic Co-operation and Development) countries, particularly for drinks containers. A certain amount of money (a deposit) is paid on the purchase of a product contained in a certain type of packaging. It is refunded when the packaging is returned to the retailer or a treatment center **[3].**

3.2. Valuation of the environment

The notion of value is central to economics. Assigning a value to the environment and the ecosystem services it provides is supposed to enable it to be better taken into account in strategic choice equations.

However, this assignment is difficult: what value can be placed on an ecosystem function such as air production when air cannot be purchased (unlike water), or on a species of beetle involved in the decomposition of dead wood and the formation of humus, and threatened with extinction by the construction of a motorway? This value could be either:

- Infinite: in this case, one option is not to build the motorway;

- Nil: in this case, the motorway should be built at all costs;
- Intermediate: the final choice will be determined by comparing the value given to this motorway and the value given to this particular species of beetle?

Assigning a value to the construction of the motorway is relatively easy (how many people will use it? how much time will be saved?); an environmental component can even be included (how much CO_2 will be saved by removing the traffic jams along the nearby trunk road?). It's easy to imagine that the economic value of the beetle species is less easy to determine. Who would be prepared to pay to save this species? And, above all, how much? With reasoning like that, we wouldn't put much stock in the beetles' skins given the sums involved... So we need to move the question onto a symbolic level: are we prepared to reduce biodiversity in order to build a motorway? Formulated in this way, the beetles have every chance of threatening the motorway project.

3.2.1. Economic valuation of the environment

Assigning a value to environmental components is fundamental but complex. Several methods are used to do this:

A) Transport or travel cost method: how far are people prepared to travel to enjoy a landscape or an object? We measure the cost of transport actually spent by individuals to come to a particular place (for example, someone who travels thousands of kilometers to visit a tourist attraction (the Eiffel Tower, botanical and zoological parks, etc.). This method was designed and is often used to assess the benefits of leisure activities. In the case of **Zimbabwe**, according to an analysis of tourist behavior based on travel costs, a trip provides each tourist with an approximate benefit of 610 dollars. Of this $610, around $275 comes from visits to nature reserves **[13].**

B) Hedonic pricing method (observation of the sums individuals spend to obtain a given environmental benefit). This method is mainly applied to property, where it amounts to calculating the additional cost of a beautiful landscape or "clean" air.

Hedonic models have often been used to study the contribution of various attributes - including environmental quality - to house prices and wage levels.

We know that environmental quality affects the prices that consumers are willing to pay for certain goods and services. For example, a room in a seaside hotel costs more if it has a view of the ocean rather than the 'garden'.

When applied to house prices, this approach is often referred to as **the property value** approach; when applied to wages, it is generally referred to as **the wage differential** approach.

In **Croatia**, for example, a hedonic analysis was carried out during the preparation of the Coastal Forest Reconstruction and Protection Project to help estimate the benefits of reforestation. This analysis showed that hotel rooms with a view of a forest landscape cost on average 3 to 6 dollars more per day than rooms in hotels located in regions without such a landscape.

C) Method of evaluating protection costs: how much are individuals prepared to pay to no longer suffer environmental damage (example: cost of moving house to no longer suffer pollution, noise, etc.).

This method seeks to identify the costs that a population can avoid by immediately protecting its environment. It consists of calculating the future expenditure that individuals avoid by their present actions to protect themselves from environmental degradation.

D) Contingent evaluation method: unlike the previous methods, this evaluation involves questioning rather than observation. In the three previous methods, we observe the cost of transport, the additional environmental cost or protection expenditure: these are sums of money that individuals actually spend. **Contingent valuation** involves revealing the value of an environmental good or service by conducting a survey: a questionnaire directly asks the individuals concerned what they would be prepared to pay in order to preserve the environment **[14].**

3.2.2. Monetary valuation of the environment

In order to evaluate environmental degradation in monetary terms, several methods used in environmental and natural resource economics have been applied, including:

- Green GDP

For some years now, economists have been thinking about green GDP. By this we mean a measure that subtracts the decline in the stock of natural resources from conventional

GDP. Such an accounting method would make it easier to know whether an economic activity is increasing or decreasing national wealth when it uses natural resources. However, economists believe that it would undoubtedly be difficult to establish this new indicator. And yet, attempts have been made to formulate a new indicator. According to (Lakehal, 2012) : "**Green gross domestic product (green GDP or ecological GDP)** is an aggregate that takes into account the destruction of non-renewable resources. Other authors such as (Peter Bertelmus, Jan van Tongeren and Carsten Stahmer, 1991) take into account the use of non-renewable resources (minerals, oil, natural gas, etc.), damage to sources of renewable goods (soil, forests, lakes, etc.), pollution (air, water) and all environmental production and restoration activities.

This approach leads to the construction of an Ecological Gross Domestic Product. The authors arrived at the following estimate: this ecological GDP represents 69% of GDP, and only 51% of GDP for the agricultural sector and 48% for the mining sector **[15]**.

4. Analysis of environmental policy applications

Environmental policy is the set of decisions and actions implemented by public authorities to guarantee the integrity of ecosystems, natural resources and the living environment of populations. The State, as a political organisation, is the expression of the social contract, or rather the alliance sealed between human groups wishing to build their future together on a daily basis, a happy future, of course **[16].**

Any environmental policy serves to perpetuate a high standard of living for the people who benefit from it. Environmental management must therefore be central and highly strategic in relation to the other functions of the State, given that the earth is the basis and condition of all social life. It implies an individual and collective attitude capable of guaranteeing and perpetuating its integrity and health, and hence the goods and services it provides. Thus, the quality of an environmental policy, a prerequisite for sustainable development, will be recognized by its impact on the face and natural systems of the territory.

4.1. Integrating environmental management into a general framework of ecological economy

The State's environmental policy, in such a context, must be integrated into the country's economy at the same time as it must guide and condition it. For the political and technical implementation of such a project, the State needs partners.

4.1.1. The role of public authorities

State institutions have worked hard to develop laws and regulations in favor of an exemplary environmental policy. The legal framework in this sector is well equipped.

A. Institutional developments

Institutional developments will have to take the greatest possible account of the postulate of an ecological economy. It is the duty of the public authorities to guide all economic and social players along the reasonable path of an economy based on the ethics of nature, respect for the environment and its principles, and not on the imperatives of economic performance alone.

From a political point of view, what is desirable is a real consecration of the theme of Ecology as well as the recognition of its basic character in the order and functioning of the three powers. To put it more clearly, there must be a legal framework for reflection and action in this area in the legislative, executive and judicial branches.

- *Parliament's Environment Committee* should be strengthened and given special status due to the basic nature of the subject matter, which would be a step forward.

- *In the executive system*, we need to look at the importance given to the Ministerial Department of the Environment, Water and Forests. This department will have to work in close collaboration with the Planning and Development Department, because environmental conservation is a question of regional planning. Similarly, the Ministry of the Environment should be much more involved in the activities of other ministries.

- Another solution is to create an Eco-Economic or Ecological Reorientation Authority that would include scientists, members of Parliament, the main courts, the Economic and Social Council, the executive, the main State administrations and, of course, civil society.

- Tax reform is also a major tool for building an environmentally-friendly economy by reinforcing the polluter pays principle and other more effective means such as tax shifting, transfer of subsidies, labeling and tradable permits.

- In addition, emphasis must be placed on cooperation with external partners, in particular those dealing with environmental issues, with the aim of keeping abreast of these issues in order to conduct sufficiently informed policies, such as UNEP (United Nations Environment Program), UNDP (United Nations Development Program) and WWF (World Wildlife Fund).

B. Educating people

Environmental education of the population is necessary for the transition to an economy based on environmental principles and the encouragement of actions carried out and the training of economic and social partners in environmentally viable projects.

In conclusion, the public authorities have a duty to incorporate into their political vision the need to move from a traditional economy that wastes resources to one that is in harmony with the environment. They will also need to adopt the civic attitude and measures necessary for its gradual, reasonable, reasoned but resolute implementation.

4.1.2. The role of populations

A. The administration of local authorities

Such an approach must not in any way overshadow the serious questions raised by poorly understood decentralization, which would constitute a major risk for natural resources.

The aim of local authorities is to empower local people to achieve local development. In this context, the importance of the social project and action program drawn up at local level by the representatives of the local population is obvious.

These discussions must take into account all the knowledge, statistics and experience acquired locally, nationally and internationally in the field of ecology.

B. The civil society

Civil society is an interesting breeding ground for raising awareness of an ecological economy. This awareness must be based on the following three pillars:

- Ecology and the advantages of an ecological economy;
- The country's ecological values and patriotic attitude towards the earth;
- A moral attitude towards the environment and the people who inhabit it.

Three inseparable pedagogical axes: Every inhabitant, every child, every person concerned about the development of the country, every true patriot, every good believer must necessarily make this triple message their own.

To do this, the leaders of civil society organizations must not only relay it to their various structures, but also help to promote ecological issues in all their dimensions: politics, economics, religion, morality, science and art.

5- CASE STUDIES

ENVIRONMENTAL POLICY IN ALGERIA

In Algeria, awareness of environmental problems has been gradual. The approach followed has been to establish, in successive layers and by sector, the institutional framework for environmental management. However, environmental management has run into a number of problems due to the absence of certain implementing legislation.

- Most of the institutions that have been set up have a field of action based on narrow and compartmentalized concerns, which limits the effectiveness of actions.
- The legislative framework is also insufficient. Although Algeria has drawn up a framework law for the environment (5 February 1983), its application has been delayed by excessive procedures and inadequate design.

At the same time, a number of institutions have been set up, including:

- The General Directorate for the Environment and the Environmental Inspectorates in the various departments of the country since 1995 (the aim of which is to densify the institutional architecture and improve the capacities for monitoring and controlling the state of the environment).
- The High Council for the Environment and Sustainable Development (HCEDD) (which was supposed to enable a global and integrated approach to be taken, but in reality has not been operational).

The capacities of the latter have remained limited to different areas: strategy formulation, coordination, studies and research, monitoring and impact studies.

Objectives and perspectives

The lessons drawn from the analysis of the causes and factors of the ecological crisis clearly demonstrate the extent and seriousness of the problems associated with waste and environmental management in Algeria, which affect the health and quality of life of the population, the productivity and sustainability of natural capital, the efficiency of resource use and the competitiveness of the economy in general, as well as the regional and global environment.

The environmental objectives should therefore consist of:

a) Improving the health and quality of life of citizens

- Improving access to drinking water and sanitation services.
- Reducing the risks associated with industrial pollution.
- Improve air quality in major cities and around industrial zones.
- Reduce waste production and introduce integrated waste management, both institutionally and financially.
- Improve the legal, institutional and management frameworks for waste and the environment.

b) Reduce economic losses and improve competitiveness

- Rationalize the use of water resources.
- Treat industrial wastewater for reuse in the production process.
- Rationalize the use of energy resources.
- Rationalize the use of raw materials in industry.
- Minimizing the production of toxic and dangerous waste by minimizing flows.
- Recovering value from waste by reusing it as a raw material in other production processes.
- Introduce and promote new technologies that minimize waste production.
- Improve environmental management, production cost control, brand image and market value.
- Transform (or close down) the most polluting and least economically viable industrial companies **[17]**.

A multi-faceted strategy

The National Strategy for the Environment and Sustainable Development (SNEDD) and the resulting National Action Plan for the Environment and Sustainable Development (PNAEDD) herald a new era for Algeria. They are based on a critical survey of the issues and challenges facing the country, and on a wide-ranging analysis of the impact of environmental problems in Algeria.

The PNAEDD places environmental and waste management issues in the context of economic and social development, with a view to linking the envisaged "*environmental transition*" to the "*economic transition*" to which the country is committed.

A sustainable development strategy that will enable economic growth and the preservation of the balance of the various ecosystems can be broken down into five directions:

a) Strengthening the legislative and regulatory framework

It is necessary to adapt the law on environmental protection in order to improve the link between the environment and sustainable development, to introduce the principles of preventive action, precaution and the polluter-pays principle, to develop economic and financial instruments and to promote public information and participation.

It is also necessary to introduce the principles of preventive action, precaution and "polluter pays", to develop economic and financial instruments and to promote public information and participation.

The law on integrated waste management is currently being implemented. A national waste register is being drawn up. A first pilot project for a landfill center for special industrial waste is planned.

b) Institutional strengthening

Promulgating good laws is essential for protecting the environment. Having sufficient capacity is crucial to enforcing them. The priorities for improving the institutional framework include developing environmental professions, strengthening monitoring capacities, penalizing polluting activities, monitoring the quality of ecosystems, setting up an environmental information system, promoting clean technologies and waste management.

c) Setting up economic and financial instruments

- Sufficient funding per year must be allocated to environmental policy.
- The cost of such a policy cannot be the sole responsibility of the State. The users of environmental services, the consumers of scarce resources, the generators of pollution - all the economic and social agents whose activities affect the environment to varying degrees - will have to contribute to this major effort.
- The 2002 Finance Act should make it possible to begin applying the polluter-pays principle and thus generate financial resources, through the many positive provisions it contains:

  - Revaluation of the tax on the collection of ordinary waste to bring it more into line with management costs,
  - Introduction of taxes to encourage the destocking of special waste and waste linked to hospital activities,
  - Revaluation of the tax on polluting activities and introduction of an additional tax on atmospheric pollution.

The tax on waste will be used to recover a significant proportion of the costs of waste management (collection, transport, controlled landfill). The proceeds of the other taxes will be transferred, for the most part, to the environment and depollution fund (FEDEP) **[17]**.

d) International financial cooperation for the environment and sustainable development

Global cooperation has entered a new era in which economic cooperation and ecological cooperation are now inextricably linked.

While the development of poor countries is partly dependent on rich countries, the survival of the biosphere is largely in the hands of developing countries.

Faced with common threats and shared but differentiated responsibilities, nations are called upon to cooperate and forge a new alliance.

Strengthening international financial cooperation for sustainable development is essential in the current phase of economic and ecological transition.

The mobilization of national resources, backed up by foreign direct investment, is certainly capable of giving the necessary impetus to growth and sustainable development.

e) Coordination and participation

The process of drawing up the PNAE-DD will involve the various ministerial departments with environmental responsibilities, environmental agencies, the academic sector and environmental associations,

To strengthen cooperation between national and international experts from different sectors, international meetings will be organized periodically in the fields of integrated management of toxic and dangerous waste, industrial pollution, economic instruments and environmental taxation.

The setting up of the environmental information system will constitute a major database for the knowledge of the quantity and quality of common and dangerous waste, will facilitate exchanges, will make it possible to better integrate the various actions and to improve environmental governance by major theme **[17]**.

f) Awareness, education and training

- The consolidation of freedom of expression and the emergence of a plural civil society have had an immediate impact.

- The media, and particularly newspapers, regularly report on environmental degradation, but their impact is limited by the lack of journalists specializing in environmental issues.

Journalists specializing in environmental issues.

- The voluntary sector is also active, its emergence is undeniable. There are several ecological associations. Due to their youth, they have generally been local in nature and their main area of activity has been communication and awareness-raising. Some associations have been able to take certain polluting companies to court.

It should be noted, however, that few associations have the capacity to intervene in field projects.

Knowing that economic management is inseparable from environmental management, company directors must be made aware of the problems of the industrial environment.

HSE (Health, Security and Environment) departments must be set up to manage hazardous and toxic solid waste, wastewater discharges and polluting gas emissions.

The introduction of environmental education in schools is a powerful tool for raising awareness and an incomparable relay for spreading environmental awareness in society.

Algeria's environmental policy is rich in lessons, even in its most negative aspects, in the sense that it makes it possible to act on the dysfunctions recorded.

A strong political impetus will be needed to initiate actions that will rapidly lead to tangible improvements. As soon as the ins and outs of environmental policy are clearly stated, understood and, above all, accepted, awareness will develop more quickly and behavior and attitudes will change for the better.

The success of such a policy depends on the association and involvement of all interested parties, and more generally of civil society as a whole, and the operational implementation of this truly innovative policy is an essential component of Algeria's industrial and urban development **[17].**

II. Environmental law

Over the last few decades, the public, informed by scientific warnings, has become increasingly aware of the threats to the environment, prompting it to demand that the law protect the natural environment on which the well-being of mankind depends. Under growing pressure from national and international public opinion, governments began to become concerned about the general state of the environment in the 1960s and introduced legislation to combat pollution of inland waters, the oceans and the air, and to protect certain cities and regions.

At the same time, they have set up administrative bodies, ministries and special environmental agencies to safeguard the quality of life of their citizens more effectively. Developments in international environmental law have paralleled this evolution within states, reflecting a growing consensus that solving environmental problems is a priority. Today, national and international environmental law is complex and extensive. It comprises thousands of rules designed to protect the living and non-living elements of the earth and its ecological processes **[18]**.

1. Definition of environmental law

Environmental law is, by definition, a concept that calls for the protection and preservation of nature, encourages the fight against nuisance and aims to develop rural and urban areas and the natural and cultural heritage.

In legal terms, it is a very young and recent science. Environmental law encompasses laws, decrees, orders, circulars, directives and regulations derived from legislation and applicable to all citizens, as well as standards, guidelines and recommendations issued to administrators and managers.

The alliance between the natural sciences and the legal sciences has given rise to environmental law, which is considered to be the third generation of human rights **[19].**

Its first application was in France with the application of the law on the protection of nature made public on 10 July 1979 **[20]**. Algeria adopted this approach in 1983 represented by article 01 of the first chapter of **Law No. 83-03 of 5 February 1983 (Annex 01)** on the protection of the environment **[21]**, which calls for

- The protection, restructuring and enhancement of natural resources,
- Preventing and combating all forms of pollution and nuisance,

- Improving the environment and quality of life.

However, scientists, researchers and society as a whole must assimilate and understand the legal rules that will regulate the relationship between man and the environment. To this end, heads of state, in collaboration with specialists in the field, must achieve the aforementioned objectives by adopting new alternatives, taking environmental protection to be a state duty, which must be financed by state funds, take measures to prohibit and impose obligations, set costs for environmental goods and support, finance and encourage investment in the environment **[19]**

- Objectives of environmental law

The aim of introducing a judicial approach to environmental legislation is to control and constantly monitor the impact of human action on nature, and to pass judgment on any faulty action that may damage the environment and/or nature.

This protection aims to achieve clearly defined objectives, namely:

- To ensure an environment conducive to human health and existence.
- To protect the soil, air, water, vegetation and animals from the harmful effects of human activity.
- Repair the damage caused by human activity.
- Preserving production and improving the quality of the environment
- Protecting human health.
- Prudent and rational use of natural resources.
- Promoting international action to tackle regional and global environmental problems.

This is how researchers and scientists become aware of the laws that will govern their work, and which will also set limits that must not be exceeded in order to protect their health and nature. Industrialists, too, must take account of these regulations, which in principle must be included in their specifications, with the aim of managing the rational use of raw materials (from nature), and limiting as far as possible the uncontrolled dumping of waste into nature. Lastly, environmental law is also aimed at the general public, who cause successive degradations of nature, and through these laws and decrees

will know that these are offences that they will support with penalties of varying severity **[19]**.

1.1. Overview of all relevant legislation

The environment is a central concern in an international context marked by the importance attached to the challenges of the green economy.

Ecological and environmental issues are of major concern to the authorities in the various regions of the world. In addition, there is the need for economic and social development, with a requirement to find a consensus to satisfy the aspirations of populations and preserve the environment. By definition, these are cross-cutting issues that affect all sectors.

Algeria is one of the countries that have accorded the environment the utmost importance. Algerian legislation has opted for a dual approach to enacting environmental protection laws. On the one hand, it lays down protective measures to combat damage to the environment, and on the other, it determines the criminal penalties to be imposed on offenders.

In the light of the above, we will attempt to highlight the ways in which the Algerian the Algerian legislator to address the issue of environmental conservation, taking into account their

1.1.1. Administrative law and the hierarchy of texts

Firstly, there is the ***Constitution***, which defines the fundamental principles of State law and the functioning of the institutions.

The Constitution then defines:

- What falls within the scope of the law, i.e. the areas in which Parliament - the deputies (legislators) - must legislate.
- And what falls within the scope of the regulations, i.e. the areas in which the government and devolved administrations can adopt rules by decree or by order.

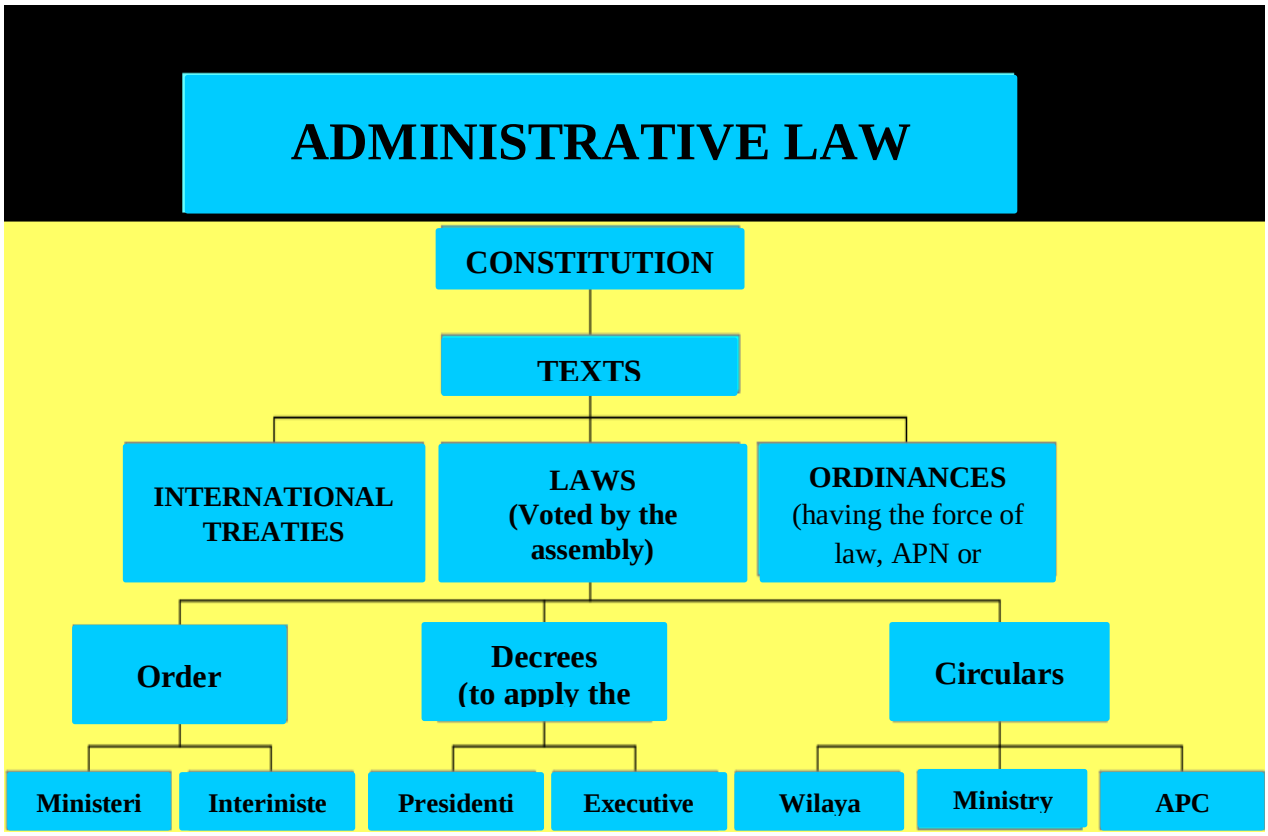

Figure 03: Hierarchy of administrative law texts

The law is above decrees and orders in the hierarchy of texts. At the very bottom of the hierarchy is the circular, which in principle has no regulatory value. It simply tells government departments how the law should be applied.

1.1.2. History of Algerian environmental protection legislation

1.1.2.1. Algerian legislative institutions

In States with a bicameral (two-chamber) legislative system, the legislative institutions are as follows the national assembly (the lower house) and the upper house or senate.

In Algeria: ***The People's National Assembly (APN)*** is made up of 407 deputies elected for a 5-year term **[22]**, and the Algerian Council of the Nation (CNA) created by the constitutional amendment of 28 November 1996. Based on a mixed method of appointment (indirect suffrage and presidential nomination), the Council has 174 members: 114 elected by indirect and secret ballot (2/3); 58 appointed by the President of the Republic (1/3) **[23].**

- The role of these institutions

- Voting on proposed legislation;
- Control of government action: written or oral questions to the government, vote on questions of confidence put to the government, vote on motions of censure against the government, etc.
- Amendments to the Constitution: If a constitutional amendment is not carried out by referendum, it must be passed by both the National Assembly and the Senate.
- Right of initiative and right to table bills. Different procedures have been put in place for different subjects.

1.1.2.2. Chronology of the creation of Ministries responsible for the environment

- 1974: creation of the National Environment Council (CNE)
- 1977: Ministry of Water, Land Development and Environmental Protection
- 1981: Secretariat of State for Forests and Land Development
- 1983: Creation of a national agency for environmental protection (ANPE)
- 1984: Ministry of Hydraulics, Environment and Forests
- 1988: Ministry of the Interior and the Environment and Ministry of Agriculture
- 1990: Ministry of Research, Technology and the Environment
- 1992: Ministry of National Education
- 1993: Ministry of Universities
- 1994: Ministry of the Interior, Local Authorities and the Environment
- 1996: Creation of a Secretary of State for the Environment
- 2000: Ministry for Spatial Planning and the Environment
- 2007: Ministry for Spatial Planning, the Environment and Tourism
- 2008: Ministry for Spatial Planning, the Environment and Cities
- 2012: Ministry of Regional Planning and the Environment **[24].**

1.1.2.3. Creation of environmental institutions

The institutional and regulatory framework for environmental management has been improved by the introduction of pollution measurement methods through the equipping of environmental laboratories. A number of bodies have been set up, including

- The National Centre for Cleaner Production Technologies (CNTPP).

- The National Observatory for the Environment and Sustainable Development (ONEDD).
- The National Waste Agency (AND).
- The National Conservatory for Environmental Training (CNFE).
- The National Centre for the Development of Biological Resources (CNDRB).
- The National Coastal Commission (CNL).
- The National Centre for Cleaner Production Technologies (CNTPP).
- The High Council for the Environment and Sustainable Development (HCEDD).
- The Environment Departments of the Wilayas.
- State Secretariat for the Environment (SECE)
- National Environmental Action Plan (PNAE)
- National Water Council (CNE).
- National Environment Fund (FNE) **[24]**

1.1.2.4. Secretary of State for the Environment

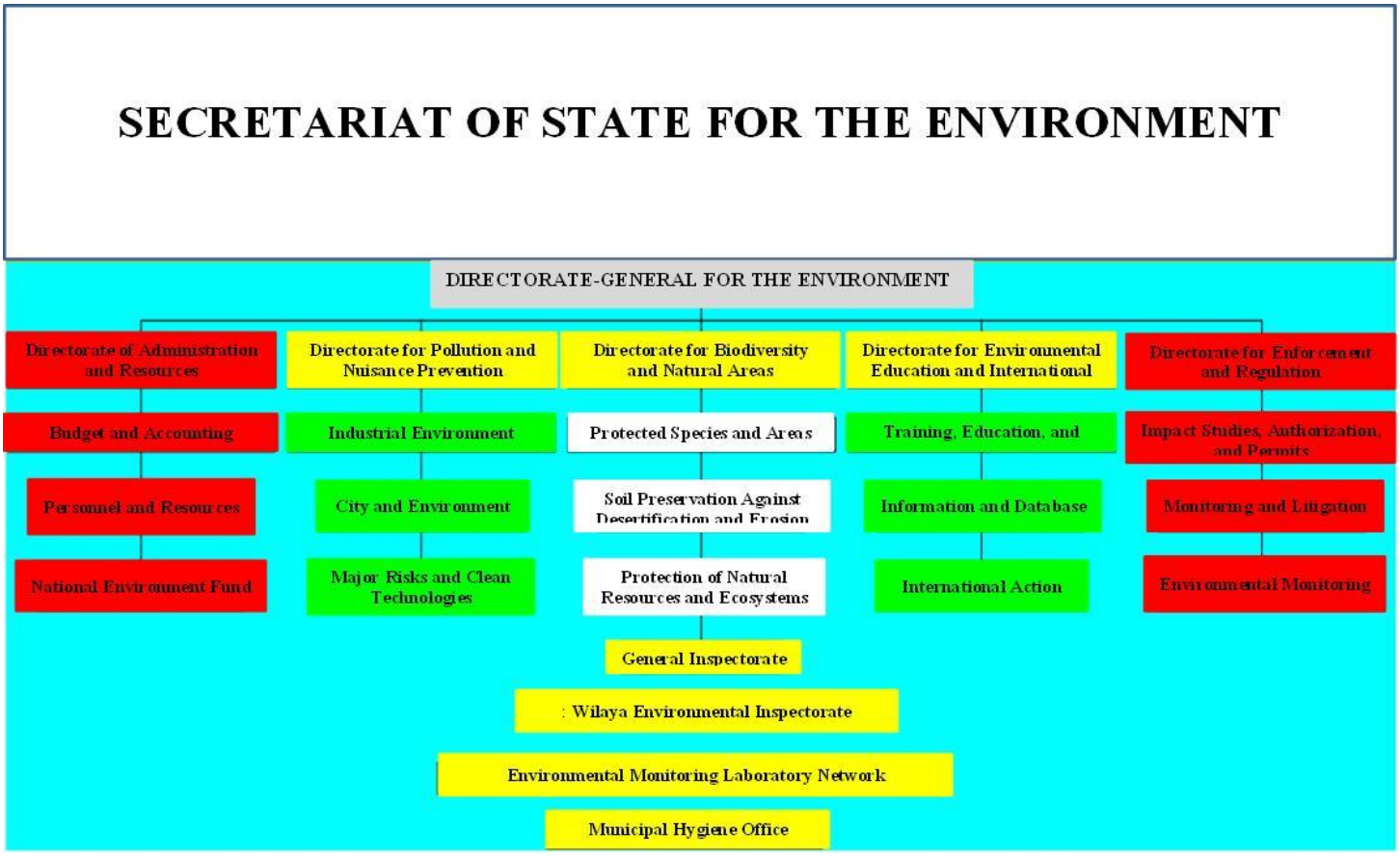

Figure 04: Representation of the State Secretariat in charge of the Environment.

1.1.2.5. Algeria's accession to international treaties and international cooperation

A. Conventions ratified by the Algerian State **[24]**

International conventions go through a number of procedures before they come into force for the countries concerned, namely opening for signature, accession, approval and ratification.

Algeria, like many countries around the world, has signed and ratified several conventions since independence. Accession to these conventions reflects Algeria's commitment to working with the international community to protect the environment and combat climate change.

In chronological order, the treaties and conventions to which Algeria has acceded are listed below:

- The Convention on Wetlands of International Importance on 2 February 1971 in Ramsar (Iran), signed by Algeria on 11 December 1982 with the aim of conserving and making wise use of wetlands through local, regional and national actions and international cooperation, as a contribution to achieving sustainable development throughout the world.

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (03 March 1973) in Washington, ratified by Algeria in 1982 (**Decree No. 82-439**).

- The African Convention on the Conservation of Nature and Natural Resources, This convention came into being with the aim of preserving natural areas against any negative changes that may affect them, and conserving natural resources in African countries, ratified by Algeria on 11 December 1982 (**Decree No. 82-440**).

- **Bamako Convention** on the Ban of the Import into Africa of Hazardous Wastes and on the Control of Trans boundary Movements and Management of Hazardous Wastes within Africa, signed by Algeria in 1991.

The United Nations Framework Convention on Climate Change, which deals with environmental changes that affect the balance of natural ecosystems, the functioning of socio-economic systems and human health. This convention was opened for signature on 09 May 1992, and just one year later Algeria ratified the convention on 10 April 1993 **(Presidential Decree No. 93-99).**

- The Rio Convention on Biological Diversity, held in Rio de Janeiro on 05 June 1992, was ratified by the Algerian State on 6 June 1995 (**Presidential Decree No. 95-163**).

- The United Nations Convention to Combat Desertification, which was held on 17 June 1994 in Paris, was ratified by Algeria on 22 January 1996. This Convention was adopted to encourage States to be vigilant and to put an end to desertification and preserve green spaces. **(Ordinance No. 96-04)**

- **Montreal Protocol** adopted by the fourth meeting of the parties in Copenhagen, 23-25 November 1992, ratified by Algeria on 14 June 1999. **(Presidential Decree No. 99-115**)

- The international convention on the protection of plants, which was held in Rome and opened for signature on 06 December 1951, it was revised from 9 to 10 November 1979. Algeria became a member on 07 May 1985, and after more than 17 years of this revision

Algeria ratified this convention on 25 December 2002. **(Decree No. 85-112**)

- **Basel Convention** on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal adopted by the Conference of Plenipotentiaries adopted in Geneva on 22 September 1995, signed by Algeria in 1998 and ratified on 22 May 2006. (**Presidential Decree No. 06-170)**

- **Stockholm Convention** on Persistent Organic Pollutants, adopted in Stockholm on 22 May 2001, signed by Algeria in 2001 and ratified on 7 June 2006. (**Presidential Decree No. 2006-206)**

- Protocol concerning specially protected areas and biological diversity in the Mediterranean, signed in Barcelona on 10 June 1995, ratified by Algeria on 14 November 2006. (**Presidential Decree No. 06-405**)

- **Montreal Protocol** adopted by the ninth meeting of the parties in Montreal, 15 – 17 September 1997, ratified by Algeria on 19 March 2007. (**Presidential Decree No. 07-93**).

- **Montreal Protocol** on substances that deplete the ozone layer, adopted in Beijing on Beijing on 3 December 1999, ratified on 19 March 2007. (**Presidential Decree No. 07-94**)

- **Agreement on the Conservation of Cetaceans of the Black Sea**, **Mediterranean Sea and Contiguous Atlantic Area**, signed in Monaco on 24 November 1996, ratified by Algeria on 19 March 2007. (**Presidential Decree No. 07-95**)

- The International Convention on Intervention on the High Seas in the Event of an Accident Causing or Likely to Cause Oil Pollution, adopted in Brussels on 29 November

1969 and its protocol, made in London on 02 November 1973, Algeria ratified the convention on 10 July 2011. **(Presidential Decree No. 11-246)**

- **Memorandum of understanding between Algeria and Tunisia** in the fields of energy management and renewable energies, signed in Algiers on 2 July 2009, ratified on 11 December 2012. (**Presidential Decree No. 12-416**)

- **Memorandum of understanding between Algeria and Kuwait** in the field of environment and sustainable development, signed in Kuwait-City on 2 October 2013, ratified on 30 December 2014. **(Presidential Decree No. 14-376)**

- **Paris Agreement on climate change** adopted on 12 December 2015 JO.N° 60 2016, ratified by Algeria on 13 October 2016. (**Presidential Decree No. 16-262**)

Algeria has ratified a total of 23 international conventions and protocols relating to the environment, covering the following areas

- Protection of the sea
- Protection of natural biological resources
- Protection of the atmosphere
- Combating desertification
- Control of hazardous waste **[24].**

B. International environmental cooperation

➢ ***Projects***

- *UNDP project (United Nations Development Program)*: the program has been present in Algeria since 1977. It aims to promote diversified, resilient and sustainable development in Algeria and to strengthen national capacities for environmental protection.

- *Cooperation project with GTZ-Germany*: management of solid waste and liquid discharges.

- *Project with the Global Environment Fund*

  - Setting up an oil pollution management system
  - Development of a strategy and national program on biological diversity.
  - Mediterranean Action Program on pollution from land-based sources origin

- *Project with METAP (Technical Assistance Program for the Protection of the Mediterranean Environment)*

- National environmental action plan
- Management and planning of sensitive areas

- *Project with the World Bank*: industrial pollution control (Annaba)

- *Project with the Mediterranean Action Plan (MAP)*: (sustainable development of the Algerian coastline) **[25]**.

➢ ***International environmental organisations***

- *GEF*: Global Environment Fund
- *MAP*: Mediterranean Action Plan
- *AIO*: International Association for the Mediterranean
- *METAP*: Mediterranean Environmental Technical Assistance Program
- *CLEI*: Centre de Liaison pour l'Environnement International (based in Nairobi)
- *RAED*: Arab Network for the International Environment (based in Cairo)
- *UNEP*: United Nations Environment Program

➢ ***Conferences***

- ***1972: Stockholm Conference:*** The Stockholm World Conference was the first United Nations conference on the environment and was held on 16 June 1972, constituting the first Earth Summit. It adopted a declaration **(United Nations Conference. 1972**), proclaiming 26 major principles to be applied to the environment. This declaration materialized the international community's awareness of the danger threatening the environment.

It was there that the first major principle of the fundamental human right to the environment was adopted. to the environment, i.e. to "freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being". **(United Nations Conference, 1972),** such principles are, of course, non-binding. It was following this conference that a number of states enshrined in their constitutions, or in their legislation, the right to water.

As for international environmental law, it is developing out of a maze of texts, treaties, agreements, conventions, procedures and other special commissions, continually growing without catching up with the harmful effects of industrial development **[26].**

Point 6 of the preamble to the declaration proclaims that "Protecting and improving the environment for present and future generations has become an essential objective of mankind" **[27].**

The Stockholm Declaration on the Human Environment is considered to be the birth or founding act of international environmental law, and has since become an area of international relations in its own right **[28].**

- *1983: Brundtland Commission and Report:* the United Nations General Assembly decided to set up a World Commission on Environment and Development (the Brundtland Commission, named after its President, the Norwegian Prime Minister Gro Harlem Brundtland) to find a solution to the problem of satisfying the basic needs of an ever-growing world population.

In 1987, the Brundtland Commission produced a report entitled "Our Common Future", better known as the "Brundtland Report", which provided a definition of sustainable development: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

- *1992: Rio Conference and Agenda 21*: The Brundtland Report served as the preparatory document for the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit or the Rio de Janeiro Conference (Brazil), which was held from 4 to 14 June 1992 and brought together representatives of 175 States, various governmental organizations and some 2,400 representatives of non-governmental organizations (NGOs) **[29]**. To give concrete form to sustainable development in terms of an international action program, a series of conventions was adopted on specific environmental issues (climate change, biodiversity and forest protection), setting out guidelines for more balanced economic policies.

- ***Agenda 21*** is an action program for sustainable development. It was adopted at the Rio Earth Summit in 1992. The preamble to the text states that Agenda 21 "addresses the urgent problems of today and also seeks to prepare the world for the tasks ahead in the next century". Agenda 21 is made up of 27 principles, including sustainable development, the link between the right to development and environmental protection, the special needs of developing countries, the need for citizen participation and the role of women.

- December 1997: Kyoto Conference and Protocol. This protocol commits industrialized countries and countries in transition to reducing emissions of the main greenhouse gases by 5.2% by 2008-2012.

- In June 1997 in New York, the United Nations General Assembly took stock of the implementation of Agenda 21 and concluded that it had failed. The Heads of State were unable to agree on a joint political declaration.

- August 2002 World Summit on Sustainable Development: held in Johannesburg, South Africa, from 26 August to 4 September 2002, also known as Rio+10, was the third major conference to coordinate collective international action on the environment. Following on from the Doha round of international trade negotiations launched a few months earlier in November 2001, it brought together more than 21 000 participants and virtually all the world's states, with a record 191 states represented by 104 heads of state or government and more than 8000 delegates, as well as 7000 NGO representatives and 4000 journalists **[26].**

The Conference focused on strengthening the implementation of sustainable development. In other words, the Johannesburg Summit also addressed the issue of sustainable development more specifically, reorienting its meaning and content and advocating its operationalization, with both the Political Declaration and the Plan of Implementation emphasizing the three pillars of this concept **[30].**

1.2. Application of environmental law

For a very long time, man has adopted the behavior of a consumer and user of environmental goods, without worrying about the depletion and deterioration of the environment. The environment is a precious commodity that still has no equivalent price. We use water, air, soil, animals and plants, but we release waste, pollutants and toxic substances without any control or prosecution. To combat this, the state has several alternatives:

- Consider environmental protection to be a duty of the state and finance it from public funds.
- Impose injunctions, bans and obligations.
- Set costs for environmental goods, for example in the form of taxes.
- Provide subsidies and tax breaks for environmental investments.

The introduction of a policy to protect the environment can only be achieved through the application of laws and decrees. The application of legislation will only be beneficial if the following scenarios are followed:

- First scenario: A ministerial decree has been put in place to control and monitor the impact of all human actions on the environment. This is **Article 2 of Executive Decree No. 90-78 of 27 February 1990** on environmental impact studies, and its content is as follows: "All works, developments or structures which, due to their size or impact, may directly or indirectly harm the environment, and in particular public health, agriculture, natural areas, fauna, flora, the conservation of sites and monuments and neighborhood amenity, are subject to the prior impact assessment procedure".

In the same vein, and out of a concern to properly manage the problem of environmental protection and to entrench the notion of sustainability, the Algerian state took care to create the **HCEDD** (High Council for the Environment and Sustainable Development), by means of **Presidential Decree No. 94-465 of 25 December 1994 creating the High Council for the Environment and Sustainable Development** and setting out its remit, organisation and operation **[19].**

- Second scenario: standardization in order to control the pollution generated by liquid, solid and gaseous discharges, safeguard the health of the population and protect the environment, the Algerian state must adopt standards, recommendations or directives that specify the concentration values (or emission factors) of pollutants to be respected in the environment, in terms of both average and peak pollution.

However, standards and directives are only part of an adequate environmental management strategy. Legislation, control mechanisms, taxes and awareness-raising are also necessary. Algeria introduced the concept of standardization in 1989, following the publication of **Law No. 89-23 of 19 December 1989 on standardization.**

A standard is not set in stone. They can be revised in line with changes in the country's resources and scientific knowledge of the impact of pollution on health and ecosystems. There are various national and international regulations. The most influential are:

- WHO recommendations
- European Union directives

- US EPA standards (United States Environmental Protection Agency)
- The International Organisation for Standardization ISO

- Third scenario: the application of penalties and punishment. A law or decree is only credible if it is accompanied by a penalty for infringement. However, it is essential to implement a series of penalties and punitive procedures for all individuals or establishments that break the limits and prohibitions laid down by the regulations and legislation. Punishment, however, will have the function of imposing compliance with regulations and establishing respect for nature, and several chapters of laws and decrees are the subject of penalties and punishments. For example**, Article 55 of Chapter VI of Law No. 83-03 of 5 February 1983** on environmental protection imposes the following penalty for atmospheric pollution: "*A fine of between 1. 000 to 10,000 dinars and, in the event of a repeat offence, a prison sentence of between 2 and 6 months and a fine of between 10,000 and 100,000 dinars, or one of these two penalties only, shall be imposed on anyone who pollutes the atmosphere, as defined in articles 32, 33 and 34 of this law*". The heavier the penalty, the more people will fear it and the safer the environment will be **[19]**.

1.3. Citizen participation

The right to the environment is an objective that reflects a universally shared aspiration to have an appropriate living environment, expressed today "in the form of a fundamental human right, that of living in a healthy and balanced environment" **[31].**

Since social equilibrium also depends on respect for ecological obligations, those we call citizens will gradually be required to fulfill their civic duties towards the environment.

The impact of climate change and the complexity of environmental issues for future generations have given rise to public demand for new forms of participation. Participation is about sharing power, helping to improve future decision-making and getting citizens actively involved in environmental issues. With the emergence of environmental human rights comes the right to citizen participation in environmental matters **[32]**.

1.3.1. The principle of participation in the environment

To participate is to take part in shaping a political decision or to cooperate with others. According to a legal dictionary, participation is « a principle of organizing the way institutions operate, which consists in involving the interested parties or their representatives in the decision-making process ».

Participation is a form of citizen involvement and intervention in the preparation and taking of administrative decisions in the various areas of public life. This involvement is decisive when it comes to the environment, which is of great interest because of the universality of the challenges to be met and the dangers associated with the irreversibility of choices at international and national level **[33]**.

When it comes to the environment and sustainable development, the involvement of the general public is fundamental, as it often requires a change in lifestyle and behavior, particularly when it comes to consuming our daily needs.

The principle of participation means allowing citizens to be involved in the choice of a facility or the ecological solution for a development that could have an impact on their immediate environment, and also giving them access to justice in the event of a conflict.

After being enshrined in non-binding texts such as the United Nations conference held in Stockholm (Sweden) in 1972, which made citizens responsible for preserving and improving the environment, or the World Charter for Nature proclaimed by the United Nations General Assembly on 28 October 1982, and more recently the Rio Declaration in 1995, an international agreement called the "Aarhus Convention", named after a town in Denmark, was signed in 1998 by 39 countries.

The purpose of this agreement is to:

- Promote public participation in major decisions that have an impact on the environment for the greatest number of people;
- Enable a large number of individuals to have access to justice in matters of environmental legislation;
- Improve access to environmental information, whether provided by private bodies or public authorities.

The National Charter for the Environment and Sustainable Development states that everyone has "the right to live and develop in a healthy, high-quality environment that

fosters the preservation of health, cultural fulfillment and the sustainable use of the heritage and resources available therein", as well as "to participate in the decision-making process likely to have an impact on the environment". The exercise of these rights must be guaranteed by the State at national level and by local authorities at local level.

While this may seem obvious, it must be borne in mind that the environmental situations in the various signatory countries vary greatly, and that in our complex societies, controlling events requires the involvement of an ever-increasing number of players, both upstream and downstream.

Moreover, Article 2 of the National Charter for the Environment and Sustainable Development sets out seven principles to be incorporated into policies, strategies, programs and action plans by the State, local authorities, public institutions and companies, including the principle of participation. This involves actively involving companies, associations and the general public in the process of drawing up and implementing policies, strategies, programs and plans relating to environmental protection and sustainable development.

The National Charter for the Environment and Sustainable Development also lays down rules of conduct that citizens are required to respect in order to preserve the environment. Any natural or legal person, public or private, "must refrain from damaging the environment" (article 4) and "contribute to individual and collective efforts to protect the environment and promote and disseminate the culture of sustainable development" (article 5).

In addition, framework law No. 03-10 of 19 July 2003 **(Annex 02)** on the protection of the environment in the context of sustainable development sets a number of objectives, in particular to strengthen the information, awareness and participation of the public and the various stakeholders in environmental protection measures. This law is based on a number of principles, including **the principle of information and participation**, according to which everyone has the right to be informed about the state of the environment and to participate in procedures prior to decisions likely to have harmful effects on the environment.

However, the inability of citizens to monitor and challenge projects that threaten the ecological balance and biodiversity risks depriving the right to the environment of all substance and interest. Consequently, participation has become an instrument in the

service of the general interest, entrusted to citizens, who thus act as guarantors and protectors of a supreme value: the right to the environment **[32]**.

1.3.2. The right of access to information

In the field of the environment, the right of access to information and transparency presents itself in a particular way, since it is closely associated with the right to participation, since citizens can only participate by being informed. Access to and transparency of administrative documents also enables citizens to exercise control over the administration.

Furthermore, Principle 10 of the Rio Declaration on Environment and Development states that « Environmental issues are best addressed through the participation of all concerned citizens at the appropriate level. At the national level, every individual should have appropriate access to environmental information held by public authorities, including information on hazardous substances and activities in their communities, and the opportunity to participate in decision-making processes. States should facilitate and encourage public awareness and participation by making information available to the public » **[32].**

In Algeria, Chapter 1 (Art. 7) of Framework Law 03-10 of 19 July 2003 states that « Any natural or legal person who so requests shall receive from the institutions concerned information relating to the state of the environment. This information may relate to any data available in any form concerning the state of the environment and the regulations, measures and procedures designed to ensure and organize environmental protection ». However, it lays down a series of commitments on the part of citizens, who must in particular: become positively involved in the process of managing the activities inherent in their local environment and warn the local authorities and/or those responsible for the environment of dangers and any act or behavior likely to harm the environment.

2. The main legal instruments

The ambition of the political authorities in environmental matters can be seen in the legal instruments, both in the richness and variety of these regulations and in the diversity of the institutions set up to implement them.

2.1. Plans in town and country planning

Spatial planning refers to all the policies implemented to control or influence the development of an area, generally at State level, depending on political choices and the context. Spatial planning is one of the ways in which an area is appropriated. The Latin root of planning, manere evokes the house, the manse, the manor. To fit out, like moving in or moving out, originally refers to domestic space and the actions of daily life. One of the aims of spatial planning may be to correct imbalances.

The imbalance in the distribution of the population, economic activities and natural resources is considered to be a factor in the anarchic structure of the country. It is at the root of population migration to areas where there are resources to meet their expectations and daily needs (work, markets, training centers, etc.). This movement of people in search of better living conditions is causing overcrowding in the host areas.

Spatial planning is essential to rebalance, correct and/or reduce this kind of territorial imbalance, through a public policy concerning land use, the organisation of buildings, and the distribution of facilities and activities in the geographical area.

Spatial planning is an action that brings together the efforts of the State and the various economic players who cooperate to positively transform the geography of a territory while taking into consideration one or more components such as industrial locations, communications networks, urban development, etc. In other words, it also aims to protect the environment and establish sustainable development, in particular by organizing land use and the siting of infrastructures to achieve balanced development of the territory.

- The main causes of spatial planning in Algeria

After independence, Algeria suffered from an imbalance that affected all sectors of the country. The population is increasingly concentrated in the north of the country, with the inhabitants of rural areas leaving and abandoning their regions to move to urban areas. These changes have caused real problems for the country's development.

the country's development.

To combat these handicaps, Algeria must seek a harmonious and sustainable form of development for its territory, combining economic efficiency, social equity and environmental protection. In fact, these development ambitions involve controlling and organizing the growth of cities and encouraging the

In addition, the country's genetic, archaeological, historical and cultural heritage needs to be enhanced. To achieve this, Algeria must also take into account the needs of Maghreb integration and Euro-Mediterranean co-development.

Nevertheless, integration into the global economy will further reinforce the over-concentration in the northern regions. This phenomenon, which has been observed over the last few years, can only increase in the future if the public authorities do not adopt a strategy aimed at the harmonious redeployment of the country's productive forces across the whole of Algeria.

With a growing population, we need to invest in reducing the pollution load. It is estimated that 35% of the world's population currently lives in urban areas. That's why cities need to be more sustainable and inclusive to meet today's challenges. By 2030, the number of people living in cities is expected to reach 5 billion. According to the UN, more than half the population will be living in cities by 2050.

The problem of the exodus of the rural population is leading to integration into megacities, with urban expansion occurring more specifically in developing countries. Consequently, the development of sustainable urban planning and management practices is essential. In addition, emphasis must be placed on air quality, greenhouse gas emissions and waste management. Cities account for 3% of the territory. However, they emit 70% of carbon dioxide and consume 60% to 80% of the world's energy. Faced with this imbalance, changes need to be implemented to make urban areas greener. Rapid urbanisation has put increasing pressure on housing, service land and infrastructure. There are currently 900 million people living in slums. If the situation remains unchanged, this number will rise to 3 billion by 2030.

2.2. Limited immission and emission values

2.2.1. Environmental standard

The "regulatory route", used by the legislator to produce laws and standards limiting or prohibiting the degradation of natural resources and certain types of pollution.

The State monitors the various components of the environment. The standard must define limit values, alert thresholds and quality objectives, particularly for air, water, soil and subsoil, as well as the monitoring systems for these receiving environments and the measures that must be observed in the event of a particular situation (art 10).

Standards are therefore a regulatory tool. A simple way of ensuring that the optimum level of pollution is achieved by agents is to impose standards on them, which can be chosen according to two types of criteria: environmental or economic.

In the first case, they are most often based on health protection objectives, and involve setting maximum concentrations or doses of pollutants that are tolerable for health. In the second case, the setting of the standard should make it possible to achieve the optimum level of pollution previously defined: the authorities' correct assessment of the damage suffered by the victims of pollution then proves to be crucial. The graph below shows that setting an inappropriate standard can result in victims suffering excessive total damage or, on the contrary, polluters incurring excessive total pollution costs **[3].**

Standardization, a technique widely used in environmental law, involves the adoption of norms and standards aimed at regulating the manufacture, marketing, storage, packaging, transport and sale of products in conditions that respect the environment.

Environmental standards are defined in a particular way according to the categories of standards identified. In reality, the concept of standards is confusing because it covers two aspects with different purposes: legal standards and technical standards.

- Environmental standards are, above all, legal standards in that they are binding and impose on subjects of law:

- Either an obligation to do or not to do something;
- Grant these subjects authorization to do or not to do something; or
- Or empower organs of the legal system to carry out certain activities according to certain procedure.

- Environmental standards are then technical standards. They consist of specific provisions, in the form of figures, rates, tables and lists, the purpose of which is to clarify the scope of the more legal general standards.

- To clarify the scope of general standards of a more legal nature. The general view is that they may concern either;
- Either substance whose discharge into a given environment is prohibited or regulated;
- Or species that should be protected in whole or in part;

2.2.2. The different types of standards

According to the Organisation for Economic Co-operation and Development (OECD), there are four (04) types of standards:

- **The emission standard:** consists of a maximum emission ceiling that must not be exceeded on pain of administrative, criminal or financial penalties (sulphur dioxide emissions into the atmosphere, noise produced by motor vehicles, etc.). Insofar as polluting agents have an economic interest in polluting (they incur pollution abatement costs), the standard ensures that they will always choose exactly the maximum authorized level of pollution.
- **The process standards:** agents are required to use certain pollution-reducing equipment (catalytic converters, purification plants, filters, etc.). These are guideline standards that leave no freedom in the choice of means of reducing nuisances with a view to improving the quality of the environment.
- **The quality standards:** specify the desirable characteristics of the environment receiving polluting emissions (nitrate levels in drinking water, carbon dioxide and monoxide emission levels from motor vehicles) or the quantity of a product or dangerous substance likely to be discharged into a watercourse which is defined.
- **The product standards:** impose given levels or limits on certain product characteristics (phosphate content in detergents, sulphur content in fuels, recyclability of packaging, etc.). They therefore determine the physical or chemical composition of a given product **[34]**.

2.3. Impact assessments: content and procedure

2.3.1 General information

Environmental impact assessment cannot be defined without mentioning the precautionary principle, which is one of the general principles of environmental protection aimed at preventing catastrophic damage and does not concern reparable damage. It is, however, applied in cases where there is a risk of serious damage to the environment at an economically acceptable cost.

Environmental protection must be preceded by an impact study or an environmental audit. The former is carried out before a project is implemented, to take measures to protect the

environment. The second is carried out when the plant is in operation, to correct any damage to the environment.

The impact study is the study to which development projects, infrastructures, fixed installations, factories and other engineering structures are subject, as well as all construction and planning works and programs, which are characterized by their direct or indirect, immediate or remote impact on the environment, and in particular on the natural environment.

on the environment, in particular on species, resources, natural environments and spaces, ecological balances and the quality of life. It is an administrative procedure subsequent to the decision to obtain or refuse authorization.

This is a study assessing projects and activities that cause or are likely to cause damage to the environment and its various components. This study must be provided before any project begins, as it constitutes a basic document for obtaining authorization.

The purpose of the environmental impact assessment is to determine how a project fits into its environment by identifying and assessing its direct and/or indirect effects, and to check that the requirements for protecting the environment against any harm that may be caused by the project have been met.

The legislator has adopted two criteria for determining the nature of projects subject to impact assessment:

1) Taking into account the importance and volume of the project, which are determined by Decree 07-145 on the terms and conditions for applying the impact study determined in its Annex 1, we cite as an example:

- Development and construction projects for new industrial estates.
- Projects for the development and construction of new business parks.
- Motorway development and construction projects.

2) Taking into account the degree of foreseeable impact on the environment, particularly on resources, natural environments and spaces, ecological balance and the quality of life.

It can be deduced that the environmental impact assessment makes it possible to foresee the negative effects of projects and activities on the environment, and the measures that need to be taken to avoid the damage that may occur during the execution of these projects **[35].**

2.3.2. Objectives and content of an impact assessment

According to the work of Benabdeli (2000, 2016), the content and objectives of an environmental audit or impact assessment can be summarized as follows.

An impact study must successively present:

- An analysis of the initial state of the site and its environment, focusing in particular on its natural resources and natural agricultural, forestry, maritime or recreational areas, as well as the physical and cultural heritage likely to be affected by the project;
- An analysis of the direct and indirect, temporary and permanent effects of the facility on the environment, and in particular on sites and landscapes, fauna and flora, natural environments and biological balances, on neighborhood amenity (noise, vibrations, odors, light emissions) or on agriculture, hygiene, public health and safety, and on the protection of material assets and cultural heritage; this analysis specifies the origin, nature and seriousness of air, water and soil pollution, the volume and polluting nature of waste, the noise level of the equipment to be used and the vibrations they may cause, the method and conditions of water supply and use.

Health effects must be specifically addressed

- The reasons why, from the point of view of environmental concerns, the project presented was selected from among the solutions considered;
- The measures planned by the applicant to eliminate, limit and, if possible, compensate for any inconvenience caused by the facility, together with an estimate of the corresponding costs.

These measures are described in detail, specifying the planned layout and operating arrangements, their detailed characteristics and the expected performance with regard to the protection of waste water and gaseous emissions, the elimination of operating waste and residues, the conditions under which materials intended for processing are brought into the facility and the storage of manufactured products.

- For quarries and waste storage facilities, the conditions under which the site will be restored. For classified installations, an analysis of the methods used to assess the effects of the installation on the environment, mentioning any technical or scientific difficulties encountered in carrying out this assessment.

The impact study must deal with these points in order.

2.3.3. Approach to preparing an impact assessment

It is important to master this process, which can be summarized as follows:

A. Project background

- Introduce the initiator and his consultant
- Explain the context and rationale for the project, taking account of the opinions expressed
- Describe the alternatives to the project
- Justify the choice and solution selected
- Mention related projects

B. Description of the receiving environment

- Delineate the study area
- Describe the relevant components (natural and human environment)
- Describe the technical characteristics
- Describe discharges and nuisances

C. Project description

- Identify possible variants
- Select the relevant variant(s) (discriminating factors)
- Describe the selected variant(s)

D. Impact analysis

- Identify and characterize the impacts
- Assess the significance of the impacts
- Present mitigation options
- Select the preferred variant
- Present the possibilities for understanding
- Summarize the project

E. Risk management

- Analyze the technological risks
- Drawing up safety measures
- Drawing up an emergency measures plan

E. Monitoring and follow-up

- Propose a monitoring program
- Propose a follow-up program **[36].**

2.3.4. Determining impacts

The main aim is to describe the relationship between the project and the various components of the environment, using appropriate methodology and criteria. The possible repercussions of the project on the environment must be assessed with maximum certainty and precision. The impacts to be assessed are

- Direct and indirect impacts
- Positive and negative impacts
- Cumulative impacts
- Deferred and irreversible impacts

The criteria for determining the anticipated impacts must be clearly defined. The criteria can be summarized as follows:

- Intensity or magnitude of the impact (degree of disturbance to the environment)
- Extent of the impact (spatial dimension)
- Duration of the impact (temporal aspects and character)
- Frequency of impact (occurrence, character)
- Level of uncertainty of the impact (reliability of the estimate)
- Probability of the impact

2.3.4.1. The effects on the quality of environmental factors, namely :

- Water resources: surface water, groundwater, water bodies and their integrity, the potential of aquifer formations. The effects are assessed on the basis of the nature of the

discharges in this area by defining the concentrations and loads of the various contaminants.

- Atmosphere: assessment of pollutants released and their impact on the air using modeling based on standards.
- Soil quality: assessing the disturbance or alteration caused to the soil and its fertility.
- Vegetation
- Fauna
- Habitats
- Biodiversity
- Landscapes

2.3.4.2. Impact on the human environment

The study must indicate the impact on current and planned use of the land where the project is located. The following must be taken into account

- The effect on urbanization perimeters
- Changes to access and landscape
- Possible expropriation
- Destruction of property
- Estimated economic and social benefits
- Impact on quality of life
- Traffic, noise, odors, dust, nuisance
- Potential impact on public health
- Contaminant threatening the population

2.3.4.3. The main mitigation measures are

- Methods and measures to protect soil, banks, surface and groundwater, atmospheric quality, flora, fauna and their habitats, including temporary measures.
- Maintaining plant cover or a wooded strip around the site Installing physical or behavioral barriers to keep animals away
- Naturalizing altered areas and adding landscaping or equipment to improve the landscape, visual and aesthetic aspects of adjacent areas.
- The visual i03-10ntegration of infrastructures and facilities

- Noise integration of installations and activities for neighboring populations
- Timing of works to avoid sensitive areas
- The choice of routes for transporting materials to avoid nuisance
- Use of local labor or contracts with local companies.

2.4. Inventories: protected landscapes, sites and biotopes

Humankind has been protecting certain forests and ecosystems for at least 2,500 years. The first national park in modern times was created in Yellowstone in 1872. Today, protected areas can be found in every corner of the globe: in forty years, the number of protected areas listed by the United Nations has increased tenfold. UNEP's World Conservation Monitoring Centre has listed more than 102,000 terrestrial and marine sites covering almost 19 million square kilometers, or almost 4% of the planet. The vast majority of these sites are terrestrial, and their creation is considered to be the most significant deliberate change in the history of land-use planning.

The inventory of protected landscapes, sites and biotopes identifies the most valuable landscapes. It aims to preserve the diversity of the country's landscapes and enables the state to ensure that these landscapes retain their specific characteristics.

2.4.1. Protected areas:

The IUCN (International Union for Conservation of Nature) defines a protected area as: A clearly defined geographical space, recognized, dedicated and managed, by any effective legal or other means, to ensure the long-term conservation of nature and its associated ecosystem services and cultural values.

The definition is supplemented by six management categories (one of which is subdivided), summarized below:

Category I

- **Strict nature reserve:** strictly protected for biodiversity and possibly also for geological/geomorphological features, where visits, use and human impacts are strictly controlled and limited to ensure the protection of conservation values.

- Wilderness area: generally large intact or slightly modified areas that have preserved their natural character and influence without permanent or significant human habitation, which are protected and managed to preserve their natural state.

Category II - National Park: vast natural or quasi-natural areas set aside to protect large-scale ecological processes, as well as the characteristic species and ecosystems of a region, which also provide opportunities for visits of a spiritual, scientific, educational and recreational nature, while respecting the environment and the culture of local communities.

Category III - Monument or natural feature: areas set aside to protect a specific natural monument, which may be a topographical feature, a mountain or underwater cavern, a geological feature such as a cave, or even a living feature such as an ancient patch of woodland.

Category IV - Habitat / Species Management Area: areas that aim to protect particular species or habitats and whose management reflects this priority. Many will need regular and active intervention to meet the requirements of particular species or habitats, but this is not a requirement of the category.

Category V - Protected Landscape or Seascape: areas where the interaction of people and nature has produced, over time, a distinctive character with significant ecological, biological, cultural and scenic values and where safeguarding the integrity of this interaction is vital to protect and maintain the area, the associated nature conservation and other values.

Category VI - Protected area with sustainable use of natural resources: areas that preserve ecosystems and their associated cultural values and traditional natural resource management systems. They are generally large, with most of their surface area in natural conditions; a certain proportion is subject to sustainable management of natural resources, and moderate use of natural resources, non-industrial and compatible with nature conservation, is considered one of the main objectives **[37].**

2.4.2. Protected areas in Algeria

Algeria is one of the Mediterranean countries with unrivalled ecological diversity in terms of bioclimate, morphology, flora and fauna. This diversity translates into a wealth of high-

quality landscapes and natural environments, giving it exceptional heritage value in terms of the natural environment.

In order to protect this national heritage, our country, through the Ministry of Agriculture and Rural Development and more recently through the Ministry of Spatial Planning and the Environment, has identified a network of protected areas encompassing unique ecosystems that are representative of the country's biological diversity, in accordance with **law No. 03-10 of 19 July 2003** on environmental protection in the context of sustainable development, in which the legislator defined the concepts of protected landscapes, sites and biotopes.

Article 4

For the purposes of this Act

- Protected area: An area specially dedicated to preserving biological diversity and the natural resources associated with it.
- □ Natural area: Any territory or portion of territory that is characterized by its environmental features. Natural areas include natural monuments, landscapes and sites.
- Biotope: A geographical area where all the physical and chemical factors of the environment remain substantially constant.
- Biological diversity: The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
- Ecosystem: The dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.
- Site: A portion of land characterized by its geographical location and/or its history.

Algeria's commitment to several international conventions and protocols to preserve and promote its natural resources, biodiversity, landscapes and ecosystems as soon as possible. Algeria's accession to the RAMSAR and CITES conventions, and its ratification of the conventions on biological diversity and combating desertification, among others, underline the vital importance it attaches to its natural heritage and its preservation.

The protection of natural areas is regulated in Algeria by **Law 11-02 of 17 February 2011 (Annex 03)** on protected areas as part of sustainable development. 47 articles have been promulgated by the President of the Republic after consultation with the Council of State and adoption by Parliament.

Its purpose is to

- Classify protected areas;
- Determine the terms of their management and protection within the framework of sustainable development.

In its **(Art.2)**, it defined protected areas as follows: « The territory of all or part of one or more communes, as well as the areas within the public maritime domain subject to special regimes lay down by this law for the protection of the fauna, flora and terrestrial, lacustrine, coastal and/or marine ecosystems concerned ».

The law identifies seven categories of protected areas **(Art. 4.)**

A) National park: is a natural area of national interest established to protect the integrity of one or more ecosystems. Its objective is to ensure the conservation and protection of unique natural regions, due to their biological diversity, while making them accessible to the public for educational and recreational purposes **(Art. 5.).**

B) Natural park: is an area designed to ensure the preservation, protection and sustainable management of natural environments, fauna, flora, ecosystems and landscapes that are representative and/or significant of a region **(Art. 6.).**

C) Strict nature reserve: is an area established to ensure the complete protection of ecosystems or rare specimens of fauna or flora deserving complete protection. It may be located within other protected areas of which it forms the core zone **(Art. 7.).**

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In the strict nature reserve, all activities are prohibited, in particular those:

- Residing, entering, travelling or camping,
- Any form of hunting or fishing,

- Felling or capturing fauna,
- Destroying or collecting flora,
- Any form of forestry, farming or mining,
- grazing,
- Any excavation or prospecting, any sounding, earthworks or construction,
- Any work intended to modify the appearance of the land or vegetation,
- Any act likely to harm the fauna or flora and any introduction or escape of animal or plant species **(Art. 8.).**

The only activities that may be authorized under the terms and conditions laid down by regulation are the taking of samples of flora and fauna or specific activities for the purposes of scientific research or which are of an urgent nature and of national importance.

D) Nature reserve: is an area set aside for the conservation, protection and/or restoration of species of fauna, flora, ecosystems and habitats. All human activities are regulated in the nature reserve **(Art. 10.).**

E) Habitat and species management reserve: is an area whose purpose is to ensure the conservation of species and their habitats, and to guarantee and maintain the habitat conditions necessary for the preservation and protection of biological diversity **(Art. 11.).**

F) Natural site: any area containing one or more natural elements of environmental importance and in particular waterfalls, craters and sand dunes **(Art. 12.).**

G) Biological corridor: any area providing a link between ecosystems or between different habitats of a species or group of interdependent species, enabling them to disperse and migrate. This area is necessary for the maintenance of animal and plant biodiversity and for the survival of species **(Art. 13.).**

The wetland is classified in one of the categories defined in article 4 **(of law n° 11-02 of 17 February 2011)**, it is broken down into three (3) zones: the water body, the flood plain and the catchment area to which differentiated protection regimes apply. The protection regimes are set by regulation.

The wetlands are of particular importance as they are a preferred wintering ecosystem for many birds, due to their wealth of flora and fauna. The most important wetlands are located in EL Kala, with lakes Tonga and Oubeïra.

Algeria has 21 protected areas covering more than 56 million hectares, of which 55.75 million hectares are located in desert zones, i.e. 24% of the national territory, including **11 national parks** with a surface area of 16,565 hectares. The twelfth national park is that of Djebel Aissa in the western southern zone; **42 wetlands** (2,958,000 hectares) classified as wetlands of international importance; **06 nature reserves**, **04 hunting reserves** and **03 hunting centers** (*Biodiversity Conservation Department - Ministry of Regional Planning and the Environment - ALGERIA*).

- Who gives an opinion and/or rules on the appropriateness of Protected Areas?

The opinion on the proposal and appropriateness of classification as a protected area and the validation of classification studies is issued by a Wilaya commission **(Art. 18.)** and a national commission **(Art. 17.)**. The opinion of the Wilaya commission is communicated to the national commission for protected areas.

To make the law on the protection of protected areas applicable, a commission has been set up in accordance with Executive **Decree No. 16-259 of 10 October 2016**, because before that there was a defect in application, with many natural areas across the country unable to benefit from the provisions laid down by Algerian legislation.

The commission is made up **of representatives from the Ministries of National Defense, the Interior and Local Authorities, Finance, Water Resources, Agriculture and Fisheries, Higher Education and Scientific Research, Tourism and Culture**, as well **as the National Agency for the Protection of the Environment** and a number of **environmental and ecological associations**.

Table No. 01: Summary of Protected Areas in Algeria (Ministry of Land Use Planning and Environment, 2022)

AIRES PROTEGEES			WILAYA	SUPERFICIE	DATE DE CREATION	PARTICULARITES
The National Parks	**Parks coastal**	- El Kala National Park	El Taref	80.000 Ha	Decree n° 83-462 of 23.07.1983	- 3 ecosystems (forest, lake and marine) - Includes a unique wetland area, classified as a Biosphere Reserve in 1990 by the M.A.B.
		- Gouraya National Park	Béjaia	2080 Ha	Decree n° 84-327 of 03.11.1984	- Single *Euphorbia dendroides* station
		- Taza National Park	Jijel	3807 Ha	Decree n° 84-328 of 03.11.1984	- Presence of the rare Kabyle Nuthatch Geomorphological features (caves and cliffs)
	Parks in mountain areas	- Théniet El Had National Park	Tissemsilt	3425 Ha	Decree n° 83-459 of 23.07.1983	- Beautiful cedar forests - The most beautiful mountain view from the summit of Kef Siga (1714 m)
		- Djurdjura National Park	Bouira-Tizi ouzou	18.850 Ha	Decree n° 83-460 of 23.07.1983	-A wealth of flora (from grasslands to the most beautiful cedar forests) -Diversity of fauna - Cave of the Maccabee and the Leopard..

		- Chréa National Park	Blida-Medea et Ain Defla	26.600 Ha	Decree n° 83-461 of 23.07.1983	Hundred-year-old Yew and Holly trees mixed with Cedars -Botanical curiosity (Berberis vulgaris) -Ruisseau des Singes.
		- Belezma National Park	Batna	26.250 Ha	Decree n° 84-326 of 03.11.1984	-Magnificent stands of Cedar. -Presence of the only stand of *Lonicera etrusca* and the very rare *Epipactis helleborine*.
		- Tlemcen National Park	Tlemcen	8225 Ha	Decree n° 93-117 of 12.05.1993	-Archaeological and speleological treasures (mosques and caves)
	Parks Saharan	- Tassili National Park	Illizi	80.000 Km²	Decree n° 72-168 of 27.07.1972.	- Rich cultural heritage (15,000 rock paintings). - Archaeological remains. - Classified as World Heritage in 1982 by UNESCO. - Classified as a Man and Biosphere Reserve in 1986 by the M.A.B.

		- Ahaggar National Park	Tamanrasset	450.000 Km²	Decree n° 87-231 of 03.11.1987	- Contains archaeological sites dating back 600,000 to 1 million years. - The highest mountain range in Algeria (Mont Tahat: 2918 m). - For over 3 billion years, it has been home to a unique and very rich natural heritage (geology, flora, fauna and landscapes).
	Parks in steppe areas	- Djebel Aissa National Park	Naama	24 400 Ha	Decree n° 03-148 of 29.03.2003	- It is of particular importance in preserving the ecosystem of the western High Plateaux region, which is threatened by desertification and silting. - It is rich in wildlife (hares, wild boars, jackals, porcupines, etc.) and plants (Atlas pistachio trees, Phoenician juniper, holm oaks, etc.). There is also esparto grass, esparto and white wormwood.
The Nature Reserves		- Macta Nature Reserve	Mostaganem Mascara	19.750 Ha		-Aquatic vegetation represented by rushes. -Attractive site for flamingos.

	- Mergueb Nature Reserve	M'Sila	13.482 Ha	1979	-Rare populations of Cuvier's Gazelle and *Houbara Barefoot.* -Unique steppe ecosystems
	- Béni-Saleh Nature Reserve	Guelma	2000 Ha	1972-73	-Barbary stag (endangered species)
	- Babors Nature Reserve	Sétif	2367 Ha	It has been the subject of discussions since 1931, but has not yet been classified.	- Endemic species: Numidian fir (flora) and Kabyle nuthatch (fauna). -Presence of a few glacial relics (*Populus tremula* and *Orchis nidus*).
	- Iles Habibas Nature Reserve	Oran	2684 Ha	Executive Decree n°03-147 of 29.032003	- They are home to numerous plant and animal species, some of which are endemic.
Hunting Reserves	- Djelfa hunting reserve	Djelfa	32.000 Ha	Decree n° 83-116 of 05.02.1983.	- Located in the middle of a natural forest of Aleppo pines.
	- Mascara hunting reserve	Mascara	7000 Ha	Decree n° 83-117 of 05.02 1883.	- Presence of the red partridge (highly endangered species)

	- Tlemcen hunting reserve	Tlemcen	2000 Ha	Decree n° 83-126 of 12.02.1983	- Main plant species: cedar
	- Zéralda hunting reserve	Tipaza	1200 Ha	Decree n° 84-45 of 18.02.1984.	- Predominantly Aleppo pine
The Hunting Centers	- Réghaia hunting centre	Boumerdès	130 Ha	Decree n° 83-75 of 08.01.1983.	- Association typique des marais (Joncs). - Incendie en Avril 1994.
	- Zéralda hunting centre	Tipaza	20 Ha	Decree n° 83-76 of 8.01.1983	- Presence of the rare Barbary Red Deer - Avifauna represented mainly by pheasants
	- Sétif hunting centre	Sétif		Decree n° 83-77 of 08.01.1983.	- Not yet a reality.
	- Mostaganem hunting centre	Mostaganem		Decree n° 83-78 of 08.01.1983.	- Area rich in flora and fauna. - Not yet completed.
	- Tlemcen hunting centre	Tlemcen	2 Ha	Decree n° 83-79 of 08.01.1983.	- Endangered genet.

3. National regulations

3.1. The Environment Code

The Environment Code is the collection of all the laws, decrees and regulations concerning the environment. It is the cornerstone of environmental regulation, helping to preserve the richness and protect the vulnerability of our natural heritage, in particular by regulating certain activities. Failure to comply with its provisions is punishable by penalties **[38].** The Environmental Code is regularly updated to meet changing needs, threats and circumstances, through a process of consultation with the public.

Faced with the seriousness of environmental problems, the environment sector in Algeria is undergoing changes, notably through the strengthening of the institutional and legal framework and the introduction of various environmental programs.

Environmental policy programs in Algeria have been launched in order to achieve objectives and envisage solutions to environmental problems, by adopting laws that state and private institutions and associations are called upon to implement.

The Environment Code defines the four basic principles of sustainable development for the reasoned and sustainable management of natural environments, which have already been discussed:

- The principle of precaution
- The polluter pays principle
- The principle of preventive and corrective action
- The principle of participation

Several reforms have affected the Algerian environmental code, but the most important is **Law 03-10**.

3.1.1. Description of Law 03-10 of 19 July 2003 on environmental protection in the context of sustainable development.

A) Objectives of the law:

The purpose of this law is:

- The implementation of a national policy for the protection of the environment within the framework of sustainable development;
- It lays down the fundamental principles and rules for managing the environment;

- The protection, restructuring and enhancement of natural resources;
- The restoration of damaged environments;
- Preventing and combating all forms of pollution and nuisance;
- Improving the quality of life;
- Promoting the rational use of available natural resources.

B) Formation of the law

The law is made up of 114 articles divided into 8 titles, namely: General provisions **(I)**; Environmental management instruments **(II)**; Environmental protection requirements **(III)**; Protection against nuisances **(IV)**; Special provisions **(V)**; Penal provisions **(VI)**; Investigation and establishment of offences **(VII)**; Final provisions **(VIII)**.

C) The foundations of environmental management under the law:

Environmental management is based on:

▪ The organisation of an information system,
▪ The definition of environmental standards,
▪ Planning,
▪ Assessing the environmental impact of development projects,
▪ The definition of specific legal regimes
▪ The involvement of individuals and associations in environmental protection.

D) The law institutes protection requirements for the following:

▪ Biological diversity,
▪ Air and the atmosphere,
▪ Water and aquatic environments,
▪ Land and subsoil,
▪ Desert environments,
▪ The sea and the living environment.
▪ Protection against nuisance (chemical substances, noise pollution).

3.2. Implementing decrees and circulars

3.2.1. Difference between decrees and circulars

➢ **A decree**

It may be signed by either the President of the Republic or the Prime Minister, bearing in mind that the authority of decrees is greater than that of orders.

Decrees may be general in scope when they lay down a rule of law, or individual when they concern a single person (e.g. an appointment).

A distinction is made between:

- Autonomous decrees, on subjects that do not fall within the scope of the law;
- Implementing decrees, which specify the terms and conditions for implementing a law;
- Allocation decrees (e.g. after the Finance Acts have been passed, which allocate the budget to the various ministries).

➢ Circulars

This is a written document drawn up by the hierarchy of an administration for the attention of staff under its authority (minister, rector, etc.). The purpose of these documents, in the form of service instructions, is to guide and assist staff or civil servants in their application of the law. Most often, a circular is issued when a new text (law, decree, etc.) is published, in order to present it to the staff who will have to apply it. But the circular must simply explain the text, and cannot add anything to it.

- **Interpretative circulars:** these simply reiterated or commented on the text (mainly laws and decrees). They did not constitute a decision, since they did not create a new rule.
- **Regulatory circulars:** which added elements to the text that they were only required to comment on and thus created new rules.

- How does the administration participate in the application of laws?

The administration participates in the application of laws in two ways:

• The administration implements the laws passed by Parliament in a very concrete manner.

• At the central level, the application of the law consists of the drafting of regulatory measures of application (decrees, orders, and circulars) that the text of the law requires.

3.2.2. An implementing decree

An implementing decree is a decree specifying how a law is to be applied. However, sometimes a law or legislative provision is never implemented for lack of an implementing decree.

A substantial legal arsenal has been put in place to enable environmental issues to be addressed with a view to sustainable development and to bring the country into line with the international commitments to which Algeria has subscribed.

A) The laws

- The law No. 83-03 of 5 February 1983 on Environmental Protection

Implementation of a national environmental protection policy:

- Protection, restoration and enhancement of natural resources;
- Prevention and fight against all forms of pollution and nuisance;
- Improving the quality of life.

- ***The law n°03-10 of 19/07/2003*** (replaces the law n° 83-03 of 5 February 1983) **relating to the protection of the environment and sustainable development.**

- *The law no. 04-03 of 23 June 2004* on the protection of mountain areas as part of sustainable development.

- *The law no. 04-09 of 14 August 2004* on the promotion of renewable energies as part of sustainable development.

- *The law no. 04-20 of 25 December 2004* on the prevention of major risks and disaster management as part of sustainable development. This law clearly defines the responsibilities of each of the players involved in prevention in industrial zones and clusters: Public authorities, local communities and operators.

- *The law no. 05-12 of 4 August 2005* on water. The purpose of this law is to lay down the principles and rules applicable to the use, management and sustainable development of water resources as a national public asset.

- *The law no. 06-06 of 20 February 2006* on the Town Planning Act.

- *The law no. 07-06 of 13 May 2007* on the management, protection and development of green spaces.

- *The law no. 08-03 of 23 January 2008* amending and supplementing law no. 05-12 of 4 August 2005 on water.

- The law n° 11- 02 of 17 February 2011 on protected areas in the context of sustainable development.

B) Some decrees and circulars implementing Law 10-03 on environmental protection.

- Executive Decree no. 08-201 of 06 July 2008, laying down the conditions and procedures for issuing authorizations for the opening of establishments breeding animals of non-domestic species and presenting these specimens to the public.

In application of the provisions of article 43 of law n°03-10 of 19 July 2003, the purpose of this decree is to set the conditions and procedures for issuing authorization for the opening of establishments for the breeding, sale, hire or transit of animals of non-domestic species, as well as establishments intended for the public display of live specimens of local or foreign fauna.

- Executive Decree 07-207 of 30 June 2007, regulating the use of ozone-depleting substances, their mixtures and products containing them.

Pursuant to the provisions of Article 46 of law n°03-10 of 19 July 2003, the purpose of this decree is to regulate the use of substances that deplete the ozone layer, their mixtures and products containing them.

- Executive Decree 06-198 of 31 May 2006, defining the regulations applicable to establishments classified for environmental protection.

Pursuant to the provisions of articles 19, 23 and 24 of law n°03-10 of 19 July 2003, the purpose of this decree is to define the regulations applicable to establishments classified for environmental protection and, in particular, the authorization and declaration systems for operating classified establishments, the procedures for issuing, suspending and withdrawing them, and the conditions and procedures for monitoring them.

- Executive Decree 06-141 of 19 April 2006, defining the limit values for industrial liquid effluent discharges.

Pursuant to the provisions of Article 10 of Law n°03-10, the purpose of this decree is to define the limit values for industrial liquid effluent discharges. It lays down the technical requirements for installations generating this type of effluent and the monitoring procedures, particularly self-monitoring, to ensure that effluent complies with the limit values set in the appendix to this present decree.

- Executive Decree No. 06-138 of 15 April 2006, regulating the emission into the atmosphere of gases, fumes, vapors, liquid or solid particles, and the conditions under which they are controlled.

In application of the provisions of article 47 of The law n°03-10 of 19 July 2003, the purpose of this decree is to regulate the emission into the atmosphere of gases, fumes, vapors, liquid or solid particles, as well as the conditions under which their control is exercised, and to sets out the technical requirements for installations and the procedures for monitoring atmospheric emissions to ensure compliance with the limit values set out in the appendix to this decree.

- Executive Decree No. 06-104 of 28 February 2006, establishing the waste nomenclature, including special hazardous waste.

Pursuant to the provisions of Article 5 of law n°03-10, the purpose of this decree is to establish the nomenclature of waste, including hazardous special waste, classified into 4 classes, namely: household and similar waste, inert waste, special waste and hazardous special waste.

- Executive Decree No. 05-240 of 28 June 2005, setting the procedures for appointing environmental delegates.

The purpose of this decree is to lay down the procedures for appointing environmental delegates in classified installations subject to authorization. Under the authority and responsibility of the operator, the environmental delegate is responsible for receiving and providing information, except in cases for which the operator is explicitly responsible, to any environmental control authority:

- Drawing up and updating an inventory of pollution at the facility concerned (liquid and gaseous effluents, solid waste, noise pollution) and its impact,
- Contributing, on behalf of the operator, to the implementation of the environmental obligations of the classified facility concerned, as set out in the legislative and regulatory provisions in force,
- Raising environmental awareness among staff at the classified facility.

- Other basic decrees of law 10-03: (JOURNAL OFFICIEL)

*** Decree no. 63-344 of 11 September 1963** on Algeria's accession to the international convention for the prevention of pollution of sea waters by hydrocarbons;

*** Decree no. 80-14 of 26 January 1980** on Algeria's accession to the Convention for the Protection of the Mediterranean Sea against Pollution, signed in Barcelona on 16 February 1976;

*** Decree 81-02 of 17 January 1981** ratifying the protocol on the prevention of pollution of the Mediterranean Sea by dumping operations carried out by ships and aircraft, done at Barcelona on 16 February 1976;

*** Decree No 81-03 of 17 January 1981** ratifying the Protocol concerning cooperation in combating pollution of the Mediterranean Sea by hydrocarbons and other harmful substances in cases of emergency, done at Barcelona on 16 February 1976;

*** Decree no. 82-437 of 11 December 1982** ratifying the cooperation protocol between North African countries to combat desertification, signed in Cairo on 5 February 1977;

*** Decree no. 82-439 of 11 December 1982** on Algeria's accession to the Convention on Wetlands of International Importance, especially as Waterfowl Habitat, signed in RAMSAR (Iran) on 2 February 1971;

*** Decree no. 82-440 of 11 December 1982** ratifying the African convention on the conservation of nature and natural resources, signed in Algiers on 15 September 1968;

*** Decree No 82-441 of 11 December 1982** on the accession of the People's Democratic Republic of Algeria to the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources, signed in Athens on 17 May 1980;

*** Decree no. 82-498 of 25 December 1982** on Algeria's accession to the Convention on International Trade in Endangered Species of Wild Fauna and Flora, signed in Washington on 3 March 1973;

*** Presidential Decree No 92-354 of 23 September 1992** on Algeria's accession to the Vienna Convention for the Protection of the Ozone Layer, signed in Vienna on 22 March 1985;

*** Presidential Decree No 92-355 of 23 September 1992** on accession to the Montreal Protocol on substances that deplete the ozone layer, signed in Montreal on 16 September 1987, and its amendments (London 27-29 June 1990);

*** Presidential Decree No 93-99 of 10 April 1993** ratifying the Convention on Climate Change adopted by the General Assembly of the United Nations on 9 May 1992;

*** Presidential Decree 95-163 of 6 June 1995** ratifying the Convention on Biological Diversity signed in Rio de Janeiro on 5 June 1992;

*** Presidential Decree No 98-123 of 18 April 1998** ratifying the 1992 Protocol amending the 1969 International Convention on Civil Liability for Oil Pollution Damage;
*** Presidential Decree No. 98-158 of 16 May 1998** on the accession, with reservations, of the People's Democratic Republic of Algeria to the Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal;

The large number of laws promulgated shows that Algeria is one of the most active countries in terms of environmental legislation. However, the environmental situation is worrying, with natural resources continuing to deteriorate due to:
- The non-conformity of implementing legislation with the framework law,
- Conflicts of jurisdiction within the institutions responsible for the environment.
- Lack of resources and financial means
- Inadequate training for staff assigned to this task.

4. The laws of conservation and classification on the scale of the biosphere

4.1. Definition of the Biosphere

The word "biosphere" first appeared in 1875 in the book The Formation of the Alps by the geologist Eduard SUESS. He defined the term as all living organisms on the entire planet, including all its strata and layers.
It was through this term that Vladimir VERNADSKY, also a geologist, established the notion of ecosystem and defined ecology as the science of the biosphere in 1920.
The biosphere is therefore the totality of living organisms and their living environments, i.e. all the ecosystems present in the lithosphere, hydrosphere and atmosphere.

4.2 Biosphere Reserves (BR)

Biosphere Reserves are places designated by UNESCO to test and illustrate sustainable development practices on a regional scale, reconciling the social and economic development of populations with the conservation of biological diversity and, more broadly, environmental protection, while respecting cultural values. Territorial dialogue between different players and institutions is encouraged, based on specific consultation mechanisms. Scientific research and follow-up, training, education and awareness-raising support the area's project. They contribute to the implementation of the Sustainable

Development Goals to which the United Nations has committed itself for 2030. BR is a useful tool for conserving ecosystems.

They are places that provide local solutions to global problems. Biosphere reserves include terrestrial, marine and coastal ecosystems. Each reserve promotes solutions that reconcile the conservation of biodiversity with its sustainable use. Biosphere reserves remain under the sovereign jurisdiction of the States in which they are located. Member States can submit sites by following the designation process.

There are currently 738 biosphere reserves in 134 countries, including 22 transboundary sites, which belong to the World Network of Biosphere Reserves.

- ABOUT UNESCO

The United Nations Educational, Scientific and Cultural Organization is a specialized international agency of the United Nations (UN), created on 16 November 1945 in the wake of the devastation and massacres of the Second World War.

According to its constitution, Unesco's purpose is "to contribute to peace and security by promoting collaboration among the nations through education, science and culture in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms which are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations".

Its pioneering work has helped to change the way the world's populations understand themselves and the planet on which we live. UNESCO initiated the environmental protection movement and sounded the alarm about the decline in the world's biodiversity, explicitly linking it to human development through the MAB Program. As a specialized agency of the United Nations, UNESCO will continue, in the near future and throughout the world, to contribute to consolidating peace, eradicating poverty, improving health and supporting sustainable development and intercultural dialogue through education, scientific activities, culture, communication and information **[39].**

4.3. What are Biosphere Reserves for?

They are there to pave the way for a positive future by establishing a connection between humans and nature today. The lifestyles of their populations seek a balance with nature with a view to building a desirable future. The aim of biosphere reserves is above all to

strengthen the links: between human beings, between human beings and nature, between knowledge and action, all the time, everywhere. If these links break down, the quality of collective life is at risk. If they remain strong, we can build a future that inspires confidence.

Biosphere reserves consist of three interdependent areas designed to fulfill three interrelated, complementary and mutually reinforcing functions:

- **The core area** comprises a strictly protected zone that contributes to the conservation of landscapes, ecosystems, species and genetic variation.
- **The buffer zone** surrounds or adjoins the core area and is used for activities compatible with ecologically sustainable practices likely to enhance scientific research, follow-up, training and education.
- **The transition area** is the zone where communities encourage socio-culturally and ecologically sustainable economic and human activities.

4.4. Functions Biosphere reserves (BR)

Biosphere reserves are intended to fulfill three complementary functions **[40]**:

A) Conservation: they contribute to the conservation of landscapes, natural ecosystems, species and genetic variation

B) Development: they facilitate and contribute to an economic and human sustainable socio-culturally and ecologically friendly development of our planet

C) Logistical support: they support the research, monitoring, promoting education and information exchange related to local, national and global conservation and development issues.

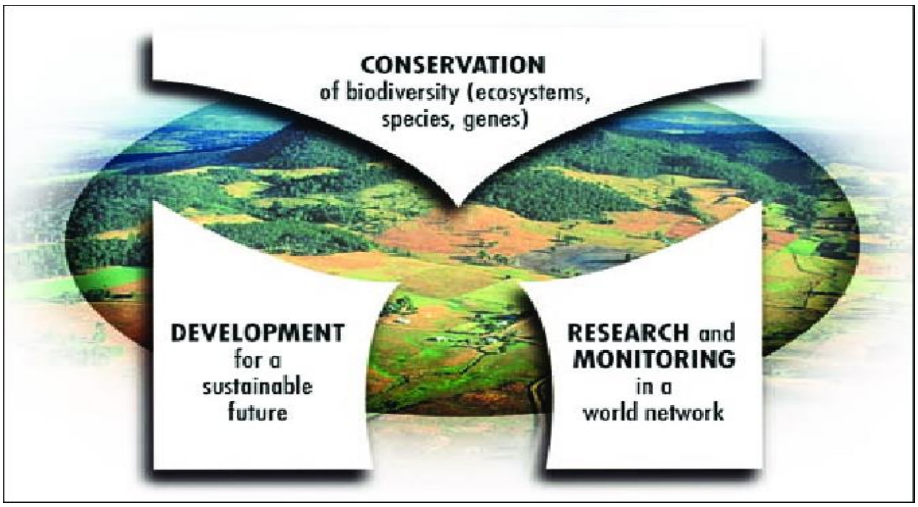

Figure 05: The three functions of biosphere reserves

In addition, biosphere reserves are representative areas of natural and cultural landscapes, most of which benefit from regulatory protection. Unlike any other category of protected area, biosphere reserves encompass habitats with different intensities of use (forests, cultivated land, residential areas, rangelands, aquatic environments, cultural heritage, etc.). Each of these habitats may be in one of three states **(i) a natural state** with little or no disturbance, **(ii) a state of use that is more or less balanced** in economic, cultural and ecological terms, and **(iii) a degraded state**. Each habitat may evolve from one state to another depending on the effects of natural and human factors.

4.5. The MAB Program

Launched in 1971, UNESCO's Man and the Biosphere (MAB) program is an intergovernmental scientific program which, from the outset, has sought to create a scientific basis for improving the links between people and their environment. MAB combines the practical application of natural and social sciences, economics and education to improve people's living conditions, distribute benefits more equitably and preserve natural and managed ecosystems by promoting innovative approaches to economic development that are socially and culturally appropriate and environmentally sustainable. In practice, the MAB Program is implemented in biosphere reserves.

With a view to promoting sustainable development, the MAB Program plays an important role in the follow-up to the Rio+20 Conference, promoting innovative, socially and culturally appropriate and environmentally sustainable approaches to economic development **[39].**

4.6. Chronology of the 'Biosphere Reserve' concept [40]

- **In 1971,** UNESCO launched the "Man and the Biosphere" program to develop the scientific knowledge needed for the sound and sustainable management of natural resources to ensure the economic and social development of populations.
- **1974/1976:** the "biosphere reserve" concept was developed by a working group of UNESCO's Man and the Biosphere Program, and the Biosphere Reserve Network was created two years later.
- **1984:** constitution of the «Action Plan for Biosphere Reserves», formally approved by the UNESCO General Conference and by the UNEP (United Nations Environment Program) Governing Council, which defines the framework for this procedure.
- **March 1995**: the "Seville Strategy" is defined at the International Conference of Experts on Biosphere Reserves. It sets the general objectives for the coming years. This conference also provided an opportunity to discuss a more precise legal framework for the creation of these reserves.
- **November 1995**: adoption by the UNESCO General Conference of a non-binding international statutory framework for the World Network of Biosphere Reserves, which precisely defines their operating principles.
- **In February 2008** in Madrid, a new action plan for biosphere reserves for the period 2008-2013 was adopted, with the aim of :

- Improve cooperation, management and communication between biosphere reserves,

- Clarify the boundaries and role of the different zones characteristic of biosphere reserves (core zone, buffer zone and transition zone),

- Increase the production of knowledge on the functioning of natural systems and their capacity for resilience,

- Encouraging the development of partnerships "to develop the functions of biosphere reserves in a cooperative manner".

- **In 2011,** the MAB program celebrated its 40th anniversary in Dresden, where the 23rd session of the International Coordinating Council (ICC) of UNESCO's Man and the Biosphere (MAB) program was held.
- **Arrêté du 3 juin 2011** portant identification des catégories d'aires marines protégées entrant dans le champ de compétence de l'Agence des aires marine. These include

those resulting from the application of the Resolution approving the Seville Strategy for biosphere reserves.

4.7. Biosphere conservation laws

These laws aim to safeguard the character, diversity and integrity of the natural environment through measures to protect flora and fauna and their communities and habitats, as well as the soil, subsoil, water and air. They include a number of articles divided into chapters, such as general provisions; protection of plant and animal species; protection of natural environments, nature reserves, forest reserves and nature parks. Algeria is wisely involved in the global environmental protection process, in particular through law n°03-10 on environmental protection as part of sustainable development.

- Some laws relating to biosphere conservation in Algeria.

1- Law no. 83-03 of 05 February 1983 on environmental protection. **(Annex 01)**

2- Law n°03-10 of 19 July 2003 on environmental protection in the context of sustainable development **(Annex 02).**

3- Law no. 07-06 of 13 May 2007, relating to the management, protection and development of green spaces.

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https://www.joradp.dz/FTP/jo-francais/2003/F2003043.pdf

Annexes

Loi n03-10 du 19 Joumada El Oula 1424 correspondant au 19 juillet 2003 relative à la protection de l'environnement dans le cadre du développement durable.

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Le Président de la République,

Vu la Constitution, notamment ses articles 119, 120, 122-19° et 126 ; Vu l'ordonnance n° 66-154 du 8 juin 1966, modifiée et complétée, portant code de procédure civile ;

Vu l'ordonnance n° 66-155 du 8 juin 1966, modifiée et complétée, portant code de procédure pénale ;

Vu l'ordonnance n° 66-156 du 8 juin 1966, modifiée et complétée, portant code pénal ;

Vu l'ordonnance n° 73-38 du 25 juillet 1973 portant ratification de la convention concernant la protection du patrimoine mondial, culturel et naturel faite à Paris le 23 novembre 1972 ;

Vu l'ordonnance n° 74-55 du 13 mai 1974 portant ratification de la convention internationale relative à la création d'un fonds international d'indemnisation pour les dommages dus à la pollution par les hydrocarbures, faite à Bruxelles le 18 décembre 1971 ;

Vu l'ordonnance n° 75-58 du 26 septembre 1975, modifiée et complétée, portant code civil ;

Vu l'ordonnance n° 76-04 du 20 février 1976 relative aux règles applicables en matière de sécurité contre les risques de l'incendie et de panique et à la création de commissions de prévention et de protection civile ;

Vu l'ordonnance n° 76-80 du 23 octobre 1976, modifiée et complétée, portant code maritime ;

Vu la loi n° 79-07 du 21 juillet 1979, modifiée et omplétée, portant code des douanes ;

Vu la loi n° 82-10 du 21 août 1982 relative à la chasse ;

Vu la loi n° 83-03 du 5 février 1983 relative à la protection de l'environnement ;

Vu la loi n° 83-17 du 16 juillet 1983, modifiée et complétée, portant code des eaux ;

Vu la loi n° 84-12 du 23 juin 1984, modifiée et complétée, portant régime général des forêts ;

Vu la loi n° 84-17 du 7 juillet 1984, modifiée et complétée, relative aux lois de finances ;

Vu la loi n° 85-05 du 16 février 1985, modifiée et complétée, relative à la protection et à la promotion de la santé ;
Vu la loi n° 87-17 du 1er août 1987 relative à la protection phytosanitaire ;
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Vu la loi n° 90-29 du 1er décembre 1990, modifiée et complétée, relative à l'aménagement et l'urbanisme ;
Vu la loi n° 90-30 du 1er décembre 1990 portant loi domaniale ;
Vu la loi n° 90-31 du 4 décembre 1990 relative aux associations ;
Vu la loi n° 97-02 du 2 Ramadhan 1418 correspondant au 31 décembre 1997 portant loi de finances pour 1998 ;
Vu la loi n° 98-04 du 20 Safar 1419 correspondant au 15 juin 1998 relative à la protection du patrimoine culturel ;
Vu la loi n° 99-09 du 15 Rabie Ethani 1420 correspondant au 28 juillet 1999 relative à la maîtrise de l'énergie ;
Vu la loi n° 01-10 du 11 Rabie Ethani 1422 correspondant au 3 juillet 2001 portant loi minière ;
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Vu la loi n° 01-14 du 29 Joumada El Oula 1422 correspondant au 19 août 2001 relative à l'organisation, la sécurité et la police de la circulation routière ;
Vu la loi n° 01-19 du 27 Ramadhan 1422 correspondant au 12 décembre 2001 relative à la gestion, au contrôle et à l'élimination des déchets ;
Vu la loi n° 01-20 du 27 Ramadhan 1422 correspondant au 12 décembre 2001 relative à l'aménagement et au développement durable du territoire ;
Vu la loi n° 02-01 du 22 Dhou El Kâada 1422 correspondant au 5 février 2002 relative à l'eléctricité et à la distribution du gaz par canalisation ;
Vu la loi n° 02-02 du 22 Dhou El Kâada 1422 correspondant au 5 février 2002 relative à la protection et à la valorisation du littoral ;
Vu la loi n° 03-03 du 16 Dhou El Hidja 1423 correspondant au 17 février 2003 relative aux zones d'expansion et aux sites touristiques ;
Vu le décret n° 63-344 du 11 septembre 1963 portant adhésion à la convention internationale pour la prévention de la pollution des eaux de la mer par les hydrocarbures ;

Vu le décret n° 80-14 du 26 janvier 1980 portant adhésion de l'Algérie à la convention pour la protection de la mer méditerranée contre la pollution, faite à Barcelone le 16 février 1976 ;

Vu le décret 81-02 du 17 janvier 1981 portant ratification du protocole relatif à la prévention de la pollution de la mer Méditerranée par les opérations d'immersion éffectuées par les navires et aéronefs, fait à Barcelone le 16 février 1976 ;
Vu le décret n□□81-03 du 17 janvier 1981 portant ratification du protocole relatif à la coopération, en matière de lutte contre la pollution de la mer Méditerranée par les hydrocarbures et autres substances nuisibles en cas de situation critique, fait à Barcelone le 16 février 1976 ;
Vu le décret n□□82-437 du 11 décembre 1982 portant ratification du protocole de coopération entre les pays d'Afrique du nord en matière de lutte contre la désertification, signé au Caire le 5 février 1977
;Vu le décret n□□82-439 du 11 décembre 1982 portant adhésion de l'Algérie à la convention relative aux zones humides, d'importance internationale, particulièrement comme habitat de la sauvagine, signée à Ramzar (Iran) le 2 février 1971
;Vu le décret n□□82-440 du 11 décembre 1982 portant ratification de la convention africaine sur la conservation de la nature et des ressources naturelles, signée à Alger le 15 septembre 1968 ;
Vu le décret n□□82-441 du 11 décembre 1982 portant adhésion de la République algérienne démocratique et populaire au protocole relatif à la protection de la mer Méditerranée contre la pollution d'origine tellurique fait à Athènes le 17 mai 1980 ;
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Vu le décret présidentiel n□□92-354 du 23 septembre 1992 portant adhésion de l'Algérie à la convention de Vienne pour la protection de la couche d'ozone, signée à Vienne le 22 mars 1985 ;
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Vu le décret présidentiel n□□93-99 du 18 Chaoual 1413 correspondant au 10 avril 1993 portant ratification de la convention sur les changements climatiques adoptée par l'assemblée générale des Nations Unies le 9 Mai 1992 ;
Vu le décret présidentiel n□□95-163 du 7 Moharram 1416 correspondant au 6 juin 1995 portant ratification de la convention sur la diversité biologique signée à Rio de

Janeiro le 5 juin 1992 ;
Vu le décret présidentiel n□□98-123 du 21 Dhou El Hidja 1418 correspondant au 18 avril 1998 portant ratification du protocole de 1992, modifiant la convention internationale de 1969 sur la responsabilité civile pour les dommages dus à la pollution par les hydrocarbures ;
Vu le décret présidentiel n□□98-158 du 19 Moharram 1419 correspondant au 16 mai 1998 portant adhésion avec réserve de la République algérienne démocratique et populaire, à la convention de Bâle sur le contrôle des mouvements transfrontières des déchets dangereux et de leur élimination ; Après adoption par le Parlement ;

Promulgue la loi dont la teneur suit : DISPOSITION PRELIMINAIRE
Article 1er. — La présente loi a pour objet de définir les règles de protection de l'environnement dans le cadre du développement durable.
TITRE I
DISPOSITIONS GENERALES
Art. 2. — La protection de l'environnement dans le cadre du développement durable a pour objectif notamment
— de fixer les principes fondamentaux et les règles de gestion de l'environnement ;
— de promouvoir un développement national durable en améliorant les conditions de vie et en œuvrant à garantir un cadre de vie sain ;
— de prévenir toute forme de pollution ou de nuisance causée à l'environnement en garantissant la sauvegarde de ses composantes ;
— de restaurer les milieux endommagés ;
— de promouvoir l'utilisation écologiquement rationnelle des ressources naturelles disponibles, ainsi que l'usage detechnologies plus propres ;
— de renforcer l'information, la sensibilisation et la participation du public et des différents intervenants aux mesures de protection de l'environnement.
Art. 3. — La présente loi se fonde sur les principes généraux suivants :
— **le principe de préservation de la diversité biologique**, selon lequel toute action évite d'avoir un effet préjudiciable notable sur la diversité biologique ;
— **le principe de non-dégradation des ressources naturelles**, selon lequel il est évité de porter atteinte aux ressources naturelles telles que l'eau, l'air, les sols et sous-sols qui, en tout état de cause, font partie intégrante du processus de développement et ne doivent pas être prises en considération isolément pour la réalisation d'un développement durable ;
— **le principe de substitution**, selon lequel si, à une action susceptible d'avoir un impact préjudiciable à l'environnement, peut être substituée une autre action qui présente un risque ou un danger environnemental bien moindre, cette dernière action est choisie même, si elle entraîne des coûts plus élevés, dès lors que ces coûts sont proportionnés aux valeurs environnementales à protéger ;

◦

- **le principe d'intégration**, selon lequel les prescriptions en matière de protection de l'environnement et de développement durable, doivent être intégrées dans l'élaboration et la mise en œuvre des plans et programmes sectoriels ;

- **le principe d'action préventive et de correction, par priorité à la source, des atteintes à l'environnement**, en utilisant les meilleures techniques disponibles, à un coût économiquement acceptable et qui impose à toute personne dont les activités sont susceptibles d'avoir un préjudice important sur l'environnement, avant d'agir, de prendre en considération les intérêts d'autrui ;

- **le principe de précaution**, selon lequel l'absence de certitudes, compte tenu des connaissances scientifiques et techniques du moment, ne doit pas retarder l'adoption de mesures effectives et proportionnées visant à prévenir un risque de dommages graves à l'environnement à un coût économiquement acceptable ;

- **le principe du pollueur payeur**, selon lequel toute personne dont les activités causent ou sont susceptibles de causer des dommages à l'environnement assume les frais de toutes les mesures de prévention de la pollution, de réduction de la pollution ou de remise en état des lieux et de leur environnement ;

- **le principe d'information et de participation**, selon lequel toute personne a le droit d'être informée de l'état de l'environnement et de participer aux procédures préalables à la prise de décisions susceptibles d'avoir des effets préjudiciables à l'environnement.

Art. 4. — Au sens de la présente loi on entend par :

Aire protégée : Une zone spécialement consacrée à la préservation de la diversité biologique et des ressources naturelles qui y sont associées.

Espace naturel : Tout territoire ou portion de territoire particularisé en raison de ses caractéristiques environnementales. Les espaces naturels incluent notamment les monuments naturels, les paysages et les sites.

Biotope : Une aire géographique où l'ensemble des facteurs physiques et chimiques de l'environnement restent sensiblement constants.

Développement durable : Un concept qui vise la conciliation entre le développement socio-économique permanent et la protection de l'environnement, c'est à direl'intégration de la dimension environnementale dans un développement qui vise à satisfaire les besoins des générations présentes et futures

.**Diversité biologique :** La variabilité des organismes vivants de toute origine y compris, entre autres, les écosystèmes terrestres, marins et autres écosystèmes aquatiques et les complexes écologiques dont ils font partie; cela comprend la diversité au sein des espèces et entre espèces ainsi que celle des écosystèmes.

Ecosystème : Le complexe dynamique formé de communautés de plantes, d'animaux, de micro-organismes et de leur environnement non vivant, qui par leurs interactions forment une unité fonctionnelle.

Environnement : Les ressources naturelles abiotiques et biotiques telles que l'air, l'atmosphère, l'eau, le sol et le sous-sol, la faune et la flore y compris le patrimoine génétique, les interactions entre lesdites ressources ainsi que les sites, les paysages et les monuments naturels.

Pollution : Toute modification directe ou indirecte de l'environnement provoquée par tout acte qui provoque ou qui risque de provoquer une situation préjudiciable pour la santé, la sécurité, le bien-être de l'homme, la flore, la faune, l'air, l'atmosphère, les eaux, les sols et les biens collectifs et individuels.

Pollution des eaux : L'introduction dans le milieu aquatique de toute substance susceptible de modifier les caractéristiques physiques, chimiques et/ou biologiques de l'eau et de créer des risques pour la santé de l'homme, de nuire à la faune et à la flore terrestres et aquatiques, de porter atteinte à l'agrément des sites ou de gêner toute autre utilisation normale des eaux.

Pollution de l'atmosphère : L'introduction de toute substance dans l'air ou l'atmosphère provoquée par l'émanation de gaz, de vapeurs, de fumées ou de particules liquides ou solides susceptible de porter préjudice ou de créer des risques au cadre de vie.

Site : Une portion de territoire particularisée par sa situation géographique et/ ou son histoire.

TITRE II

DES INSTRUMENTS DE GESTION DE L'ENVIRONNEMENT

Art. 5. — Les instruments de gestion de l'environnement sont constitués par :

- une organisation de l'information environnementale ;
- une définition des normes environnementales ;
- une planification des actions environnementales menées par l'Etat ;
- un système d'évaluation des incidences environnementales des projets de développement ;
- une définition des régimes juridiques particuliers etdes organes de contrôle ;
- l'intervention des individus et des associations au titrede la protection de l'environnement.

Chapitre 1

De l'information environnementale

Art. 6. — Il est institué un système global d'information environnementale. Ce système comporte :

- les réseaux de collecte d'information environnementale relevant d'organismes ou de personnes de droit public ou privé ;
- les modalités d'organisation de ces réseaux ainsi que les conditions de collecte des informations environnementales ;

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- les procédures et modalités de traitement et de validation des données environnementales
- les bases de données sur les informations environnementales générales, scientifiques, techniques, statistiques, financières et économiques comprenant les informations environnementales validées ;

- tout élément d'information sur les différents aspects de l'environnement au plan national et international
- les procédures de prise en charge des demandes d'informations au titre des dispositions de l'article 7 ci-dessous.

Les modalités d'application du présent article sont précisées par voie règlementaire.

Section 1

Droit général à l'information environnementale

Art. 7. — Toute personne physique ou morale qui en fait la demande, reçoit des institutions concernées les informations relatives à l'état de l'environnement

Ces informations peuvent avoir trait à toute donnée disponible sous toute forme portant sur l'état de l'environnement ainsi que sur les règlements, mesures et procédures destinés à assurer et à organiser la protection de l'environnement.

Les modalités de communication de ces informations sont précisées par voie règlementaire.

Section 2

Droit spécifique à l'information environnementale

Art. 8. — Toute personne physique ou morale, en possession d'informations relatives à des éléments environnementaux susceptibles d'affecter directement ou indirectement la santé publique, est tenue de communiquer ces informations aux autorités locales et/ou aux autorités chargées de l'environnement.

Art. 9. — Sans préjudice des dispositions législatives en la matière, les citoyens ont un droit à l'information sur les risques auxquels ils sont soumis dans certaines zones du territoire et sur les mesures de protection qui les concernent.

Ce droit s'applique aux risques technologiques et aux risques naturels prévisibles. Les conditions de ce droit ainsi que les modalités selon lesquelles les mesures de protection sont portées à la connaissance du public, sont précisées par voie règlementaire.

Chapitre 2

De la définition des normes environnementales

Art. 10. — L'Etat assure une surveillance des différentes composantes de l'environnement.

L'Etat doit définir les valeurs limites, les seuils d'alerte, et les objectifs de qualité, notamment pour l'air, l'eau, le sol et le sous-sol, ainsi que les dispositifs de surveillance de ces milieux récepteurs et les mesures qui devront être observées en cas de situation particulière.

Les modalités d'application de cet article sont précisées par voie règlementaire.

Art. 11. — L'Etat veille à la protection de la nature, la préservation des espèces animales et végétales et de leurs habitats, le maintien des équilibres biologiques et des écosystèmes, la conservation des ressources naturelles contre toutes les causes de dégradation qui les menacent d'extinction. Il peut à ce titre, prendre toute mesure règlementaire pour en organiser et assurer la protection.

Art. 12. — Outre les dispositions des articles 10 et 11 ci-dessus, l'environnement est soumis à une autosurveillance et un autocontrôle. Les mécanismes et les procédures d'autosurveillance et d'autocontrôle ainsi que les activités, les zones, les milieux récepteurs, leur contenu et les modalités de leur mise en oeuvre sont précisés par voie règlementaire.

Chapitre 3

De la planification des actions environnementales

Art. 13. — Le ministère chargé de l'environnement élabore un plan national d'action environnementale et de développement durable (P.N.A.E.D.D).

Ce plan définit l'ensemble des actions que l'Etat se propose de mener dans le domaine de l'environnement.

Art. 14. — Le plan national d'action environnementale et de développement durable est établi pour une durée de cinq (5) ans. Il est initié, élaboré et adopté selon des modalités fixées par voie règlementaire.

Chapitre 4

Du système d'évaluation des incidences environnementales des projets de développement : Etudes d'impact

Art. 15. — Les projets de développement, infrastructures, installations fixes, usines et autres ouvrages d'art et tous travaux et programmes de construction et d'aménagement, qui par leurs incidences directes ou indirectes, immédiates ou lointaines sur l'environnement et notamment sur les espèces, les ressources, les milieux et espaces naturels, les équilibres écologiques ainsi que sur le cadre et la qualité de la vie, sont soumis au préalable, selon le cas, à une étude d'impact ou à une notice d'impact sur l'environnement.

Les modalités d'application de cet article sont précisées par voie règlementaire.

Art. 16. — Le contenu de l'étude d'impact est déterminé par voie règlementaire et comprend au minimum :

- un exposé de l'activité envisagée ;
- une description de l'état initial du site et de son environnement qui risquent d'être affectés par l'activité envisagée ;
- une description de l'impact potentiel sur l'environnement et sur la santé humaine de l'activité envisagée et des solutions de remplacement proposées ;
- un exposé des effets sur le patrimoine culturel de l'activité envisagée et de ces incidences sur les conditions socio-économiques ;
- un exposé des mesures d'atténuation permettant de réduire, supprimer et si possible, compenser les effets nocifs sur l'environnement et la santé. Sont également déterminés par voie règlementaire :
- les conditions dans lesquelles l'étude d'impact est rendue publique ;

- le contenu de la notice d'impact ;
- la liste des ouvrages qui, en raison de l'importance de leur impact sur l'environnement sont soumis à la procédure de l'étude d'impact
- la liste des ouvrages qui en raison de leur faible impact sur l'environnement sont soumis à la procédure de la notice d'impact.

Chapitre 5

Des régimes juridiques particuliers

Art. 17. — Il est institué au titre de la présente loi des régimes juridiques particuliers pour les établissements classés et les aires protégées.

Section 1

Des établissements classés

Art. 18. — Sont soumis aux dispositions de la présente loi, les usines, ateliers, chantiers, carrières et mines et, d'une manière générale, les installations exploitées ou détenues par toute personne physique ou morale, publique ou privée, qui peuvent présenter des dangers pour la santé, l'hygiène, la sécurité, l'agriculture, les écosystèmes, les ressources naturelles, les sites, les monuments et les zones touristiques ou qui peuvent porter atteinte à la commodité du voisinage.

Art. 19. — Les installations classées sont soumises, selon leur importance et les dangers ou inconvénients que leur exploitation génère, à autorisation du ministre chargé de l'environnement et du ministre concerné lorsque cette autorisation est prévue par la législation en vigueur, du wali ou du président de l'assemblée populaire communale. Les installations dont l'implantation ne nécessite ni étude d'impact ni notice d'impact, sont soumises à déclaration auprès du président de l'assemblée populaire communale concernée.

Les modalités d'application du présent article sont fixées par voie règlementaire.

Art. 20. — Pour les installations relevant de la défense nationale, les dispositions de l'article 19 ci-dessus sont mises en œuvre par le ministre chargé de la défense nationale.

Art. 21. — La délivrance de l'autorisation prévue à l'article 19 ci-dessus est précédée d'une étude d'impact ou d'une notice d'impact, d'une enquête publique et d'une étude relatives aux dangers et incidences éventuels du projet pour les intérêts mentionnés à l'article 18 ci-dessus, ainsi que, le cas échéant, de l'avis des ministères et collectivités locales concernés. Cette autorisation n'est accordée qu'après réalisation des mesures prévues à l'alinéa ci-dessus.

Art. 22. — L'étude d'impact ou la notice d'impact sur l'environnement sont réalisées, à la charge du promoteur du projet, par des bureaux d'études, des bureaux d'expertise ou des bureaux de consultations agréés par le ministère chargé de l'environnement

Art. 23. — Sont déterminées par voie règlementaire au titre des installations classées :
- la nomenclature de ces installations ;
- les modalités de délivrance, de suspension et de retrait de l'autorisation prévue à l'article 19 ci-dessus ;
- les prescriptions générales applicables à ces installations ;
- les prescriptions techniques spécifiques applicables à certaines catégories de ces

installations ;
- les conditions et modalités dans lesquelles s'effectue le contrôle de ces installations et l'ensemble des mesures suspensives ou conservatoires qui permettent l'accomplissement de ce contrôle.
Art. 24. — Les dispositions de l'article 23 ci-dessus s'appliquent aux installations nouvelles.
Les conditions d'application des dispositions de l'article 23 ci-dessus aux installations existantes sont fixées par voie règlementaire.
Art. 25. — Lorsque l'exploitation d'une installation non comprise dans la nomenclature des installations classées, présente des dangers ou des inconvénients graves pour les intérêts mentionnés à l'article 18 ci-dessus, le wali, sur la base d'un rapport établi par les services de l'environnement, met l'exploitant en demeure de prendre les mesures nécessaires pour faire disparaître les dangers ou les inconvénients constatés.
Faute par l'exploitant de se conformer à cette injonction dans le délai imparti, le fonctionnement de l'installation est suspendu jusqu'à exécution des conditions imposées, avec prise des dispositions provisoires nécessaires y compris celles d'assurer à son personnel le paiement des dus quelle que soit leur nature.

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Art. 26. — Lorsqu'une installation soumise à autorisation a été ou est exploitée sur un terrain, le vendeur de ce terrain est tenu d'en informer par écrit l'acheteur des dangers ou incidences importants qui résultent de l'exploitation, qu'il s'agisse du terrain ou de l'installation.
Art. 27. — Les dépenses correspondant à l'exécution des analyses et des expertises nécessaires pour l'application des dispositions du présent chapitre sont à la charge de l'exploitant. Les modalités d'application du présent article sont fixées par voie règlementaire.
Art. 28. — Chaque exploitant d'une installation classée soumise à autorisation désigne un délégué pour l'environnement.
Les modalités d'application de cet article sont fixées par voie règlementaire.
Section 2
Des aires protégées
Art. 29. — Sont considérées au titre de la présente loi aires protégées, les zones soumises à des régimes particuliers de protection des sites, des sols, de la flore, de la faune, des écosystèmes ou de façon générale, de l'environnement.
Art. 30. — Les régimes particuliers prévus à l'article 29 ci-dessus sont constitués de règles restrictives en matière d'établissements humains, d'activités économiques de toute nature et de toute mesure destinée à garantir la conservation des composants de l'environnement que le classement au titre de ces régimes particuliers vise à protéger.
Art. 31. — Les aires protégées comprennent :
- les réserves naturelles intégrales ;
- les parcs nationaux ;

- les monuments naturels ;
- les aires de gestion des habitats ou des espèces ;
- les paysages terrestres ou marins protégés ;
- les aires protégées de ressources naturelles gérées.

Art. 32. — Sur rapport du ministre chargé de l'environnement, sont précisées, pour chaque catégorie d'aire protégée, les mesures de protection qui leur sont propres, les règles de surveillance et de contrôle des prescriptions qui les concernent, ainsi que les modalités et conditions de leur classement ou de leur déclassement dans chacune des catégories concernées.

Les modalités d'application de cet article sont fixées par voie règlementaire.

Art. 33. — L'acte de classement visé ci-dessus, peut soumettre à un régime particulier et, le cas échéant, interdire à l'intérieur de l'aire protégée, toute action susceptible de nuire à la biodiversité et, plus généralement, d'altérer le caractère de l'aire protégée, notamment la chasse et la pêche, les activités agricoles, forestières et pastorales, industrielles, minières, publicitaires et commerciales, l'exécution de travaux, l'extraction de matériaux concessibles ou non, l'utilisation des eaux , la circulation du public quel que soit le moyen employé, la divagation des animaux domestiques et le survol de l'aire protégée.

Des sujétions particulières à des zones dites "réserves intégrales" peuvent être déterminées afin d'assurer, dans un but scientifique sur une ou plusieurs parties d'une aire protégée, une protection plus grande de certains éléments de la diversité biologique.

Les modalités d'application de cet article sont fixées par voie règlementaire.

Art. 34. — Les effets de classement suivent le territoire classé, en quelque main qu'il passe.

Quiconque aliène, loue ou concède un territoire classé au titre de la présente loi, est tenu de faire connaître à l'acquéreur, au locataire ou au concessionnaire l'existence du classement, sous peine de nullité.

Toute aliénation, location ou concession doit, dans un délai ne dépassant pas quinze (15) jours, être notifiée à l'administration chargée de l'aire protégée concernée, par celui qui l'a consentie.

Chapitre 6

De l'intervention des individus et des associations en matière de protection de l'environnement

Art. 35. — Les associations légalement constituées et exerçant leurs activités dans le domaine de la protection de l'environnement et de l'amélioration du cadre de vie, sont appelées à contribuer, à être consultées et à participer à l'action des organismes publics concernant l'environnement conformément à la législation en vigueur.

Art. 36. — Sans préjudice des dispositions légales en vigueur, les associations visées à l'article 35 ci-dessus sont habilitées à agir devant les juridictions compétentes pour toute atteinte à l'environnement même pour des cas ne concernant pas leurs membres régulièrement affiliés.

Art. 37. — Les associations légalement agréées peuvent exercer les droits reconnus à la partie civile en ce qui concerne les faits portant un préjudice direct ou indirect aux intérêts collectifs qu'elles ont pour objet de défendre et constituant une infraction aux dispositions

législatives relatives à la protection de l'environnement, à l'amélioration du cadre de vie, à la protection de l'eau, de l'air et de l'atmosphère, des sols et sous-sols, des espaces naturels, à l'urbanisme ou ayant pour objet la lutte contre les pollutions.
Art. 38. — Lorsque des personnes physiques ont subi des préjudices individuels qui ont été causés par le fait d'une même personne et qui ont une origine commune, dans les domaines mentionnés à l'article 37 ci-dessus, toute association agréée au titre de l'article 35 ci-dessus peut, si elle a été mandatée par au moins deux (2) des personnes physiques concernées, agir en réparation devant toute juridiction au nom de celles-ci.

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Le mandat doit être donné par écrit par chaque personne concernée.
L'association qui exerce une action en justice en application des alinéas précédents peut exercer devant toute juridiction pénale les droits reconnus à la partie civile.

TITRE III

DES PRESCRIPTIONS DE PROTECTION ENVIRONNEMENTALE

Art. 39.

— La présente loi institue les prescriptions de protection :
- de la diversité biologique ;
- de l'air et de l'atmosphère ;
- de l'eau et des milieux aquatiques ;
- de la terre et du sous-sol ;
- des milieux désertiques ;
- du cadre de vie.

Chapitre 1

Des prescriptions de protection relatives à la diversité biologique

Art. 40. — Nonobstant les dispositions des lois relatives à la chasse et à la pêche et lorsqu'un intérêt scientifique particulier ou que les nécessités ayant trait au patrimoine biologique national justifient la conservation d'espèces animales non domestiques ou végétales non cultivées, sont interdits :
- la destruction ou l'enlèvement des oeufs ou des nids, la mutilation, la destruction, la capture ou l'enlèvement, la naturalisation d'animaux de ces espèces ou, qu'ils soient vivants ou morts, leur transport, leur colportage, leur utilisation, leur mise en vente, leur vente ou leur achat ;
- la destruction, la coupe, la mutilation, l'arrachage, la cueillette ou l'enlèvement de végétaux de ces espèces ou de leurs fructifications, ou de toute autre forme prise par ces espèces au cours de leur cycle biologique, leur transport, leur colportage, leur utilisation, leur mise en vente, leur vente ou leur achat, ainsi que la détention des spécimens prélevés dans le milieu naturel ;

- la destruction, l'altération ou la dégradation du milieu particulier à ces espèces animales

ou végétales.

Art. 41. — La liste des espèces animales non domestiques et des espèces végétales non cultivées protégées est fixée, en tenant compte des conditions de reconstitution des populations naturelles en cause ou de leurs habitats et des exigences de protection de certaines espèces animales pendant les périodes et les circonstances où elles sont particulièrement vulnérables .

Il est précisé également pour chaque espèce :
- la nature des interdictions mentionnées à l'article 40 ci-dessus qui lui sont applicables ;
- la durée de ces interdictions, les parties du territoire et les périodes de l'année auxquelles elles s'appliquent.
Les modalités d'application de cet article sont fixées par voie règlementaire.
Art. 42. — Sans préjudice des dispositions de la présente loi et des textes législatifs en vigueur, toute personne a le droit de détenir un animal, sous réserve des droits des tiers, des exigences du cadre de vie, de santé, de sécurité et d'hygiène, et dans des conditions qui excluent toute atteinte à la vie ou à la santé de celui-ci.
Art. 43. — Sans préjudice des dispositions législatives en vigueur relatives aux installations classées pour la protection de l'environnement, l'ouverture des établissements d'élevage d'animaux d'espèces non domestiques, de vente, de location, de transit ainsi que l'ouverture des établissements destinés à la présentation au public de spécimens vivants de la faune locale ou étrangère, doivent faire l'objet d'une autorisation. Les modalités et les conditions de délivrance de cette autorisation ainsi que les règles applicables aux établissements existants sont fixées par voie règlementaire.

Chapitre 2
Des prescriptions de protection de l'air et de l'atmosphère
Art. 44. — Constitue une pollution atmosphérique au sens de la présente loi, l'introduction, directement ou indirectement, dans l'atmosphère et les espaces clos, de substances de nature à :
- mettre en danger la santé humaine ;
- influer sur les changements climatiques ou appauvrir la couche d'ozone ;
- nuire aux ressources biologiques et aux écosystèmes ;
- compromettre la sécurité publique ;
- incommoder la population ;
- provoquer des nuisances olfactives ;
- nuire à la production agricole et aux produits agro-alimentaires ;
- altérer les constructions et porter atteinte au caractère des sites ;
- détériorer les biens matériels.
Art. 45. — Les immeubles, les établissements industriels, commerciaux, artisanaux ou agricoles ainsi que les véhicules ou autres objets mobiliers sont construits, exploités ou utilisés selon les exigences de protéger l'environnement, d'éviter et de réduire les pollutions atmosphériques.

Art. 46. — Lorsque les émissions polluantes de l'atmosphère constituent une menace pour les personnes, l'environnement ou les biens, leurs auteurs doivent mettre en œuvre toutes dispositions nécessaires pour les supprimer ou les réduire.

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Les unités industrielles doivent prendre toutes les dispositions nécessaires visant à réduire ou éliminer l'utilisation des substances provocant l'appauvrissement de la couche d'ozone.

Art. 47. — Conformément aux articles 45 et 46 ci-dessus, sont déterminées par voie règlementaire les prescriptions concernant notamment :

1) les cas et conditions dans lesquels doit être interdite ou réglementée l'émission dans l'atmosphère de gaz, fumées, vapeurs, particules liquides ou solides, ainsi que les conditions dans lesquelles s'exerce le contrôle ;

2) les délais dans lesquels il doit être satisfait à ces dispositions pour les immeubles, les véhicules et autres objets mobiliers existant à la date de promulgation des textes règlementaires y afférents ;

3) les conditions dans lesquelles sont réglementés et contrôlés, en application de l'article 45 ci-dessus, la construction des immeubles, l'ouverture des établissements non compris dans la nomenclature des installations classées, prévues à l'article 23 ci-dessus, l'équipement des véhicules, la fabrication des objets mobiliers et l'utilisation des combustibles et carburants ;

4) les cas et conditions dans lesquels les autorités compétentes doivent, avant l'intervention de toute décision judiciaire, prendre, en raison de l'urgence, toutes mesures exécutoires destinées d'office à faire cesser le trouble.

Chapitre 3

Des prescriptions de protection de l'eau et des milieux aquatiques

Section 1

Protection de l'eau douce

Art. 48. — Sans préjudice des dispositions législatives en vigueur, la protection des milieux hydriques et aquatiques a pour objet de satisfaire et de concilier les exigences :

- de l'alimentation en eau, de ses usages et de ses effets sur la santé publique et l'environnement conformément à la législation en vigueur ;
- de l'équilibre des écosystèmes aquatiques et des milieux récepteurs et spécialement de la faune aquatique ;
- des loisirs, des sports nautiques et de la protection des sites ;
- de la conservation et de l'écoulement des eaux.

Art. 49. — Les eaux superficielles ou souterraines, les cours d'eau, lacs et étangs, les eaux littorales ainsi que l'ensemble des milieux aquatiques font l'objet d'un inventaire établissant leur degré de pollution.

Des documents particuliers sont établis pour chacune de ces eaux d'après des critères

physiques, chimiques, biologiques et bactériologiques pour déterminer l'état de chacune d'elles.

La règlementation définit :

- la procédure d'établissement des documents et de l'inventaire cités à l'alinéa ci-dessus, ainsi que les modalités et délais de contrôle ;
- les spécifications techniques et les critères physiques, chimiques, biologiques et bactériologiques auxquels les cours d'eaux, sections de cours d'eau, lacs et étangs et les eaux littorales et souterraines doivent répondre ;
- les objectifs de qualité qui leur sont fixés ;
- les mesures de protection ou de régénération qui doivent être engagées pour lutter contre les pollutions constatées.

Art. 50. — Les installations de déversement doivent, dès leur mise en service, fournir des effluents conformes aux conditions qui sont fixées par voie règlementaire. En outre, la règlementation détermine notamment :

1) les conditions dans lesquelles doivent être réglementés ou interdits les déversements, écoulements, rejets, dépôts directs ou indirects d'eau, et de matières, et plus généralement, tout fait susceptible d'altérer la qualité des eaux superficielles ou souterraines et des eaux du littoral ;

2) les conditions dans lesquelles sont effectués les contrôles des caractéristiques physiques, chimiques, biologiques et bactériologiques des eaux de déversement et les conditions dans lesquelles il est procédé aux prélèvements et aux analyses d'échantillons.

Art. 51. — Tout déversement ou rejet d'eaux usées ou de déchets de toute nature dans les eaux destinées à la réalimentation des nappes souterraines, dans les puits, forages, ou galeries de captage désaffectés est interdit.

Section 2

Protection de la mer

Art. 52. — Nonobstant les dispositions législatives en vigueur relatives à la protection de l'environnement marin, sont interdits le déversement, l'immersion et l'incinération dans les eaux maritimes sous juridiction algérienne, de substances et matières susceptibles :

- de porter atteinte à la santé publique et aux écosystèmes marins ;
- de nuire aux activités maritimes, y compris la navigation, l'aquaculture et la pêche ;
- d'altérer la qualité des eaux maritimes du point de vue de leur utilisation ;
- de dégrader les valeurs d'agrément de la mer et des zones côtières et de porter atteinte à leur potentiel touristique.

La liste des substances et matières visées dans cet article est précisée par voie règlementaire.

Art. 53. — Le ministre chargé de l'environnement peut, après enquête publique, proposer des règlements et autoriser le déversement, l'immersion ou l'incinération en mer, dans des conditions telles que ces opérations garantissent l'innocuité et l'absence de nuisance du

déversement, de l'incinération ou de l'immersion.
Art. 54. — Les dispositions de l'article 53 ci-dessus ne s'appliquent pas en cas de force majeure, due aux intempéries ou toute autre cause, lorsque la vie humaine ou la sécurité d'un navire ou d'un aéronef est menacée.
Art. 55. — L'embarquement ou le chargement de tous matériaux, substances ou déchets destinés à être immergés en mer est subordonné à l'obtention d'une autorisation délivrée par le ministre chargé de l'environnement.
Les autorisations d'immersion délivrées valent autorisation d'embarquement ou de chargement au sens du présent article.
Les conditions de délivrance, d'utilisation, de suspension et de retrait de ces autorisations sont fixées par voie règlementaire.
Art. 56. — Dans le cas d'avaries ou d'accidents dans les eaux sous juridiction algérienne survenus à tout navire, aéronef, engin ou plate-forme transportant ou ayant à son bord des substances nocives, dangereuses ou des hydrocarbures et pouvant créer des dangers graves et imminents susceptibles de porter atteinte au littoral ou aux intérêts connexes, le propriétaire dudit navire, aéronef, engin ou plate-forme est mis en demeure de prendre toutes les mesures nécessaires pour mettre fin à ces dangers.
Dans le cas où cette mise en demeure reste sans effet ou n'a pas les effets attendus dans le délai imparti ou, en cas d'urgence, l'autorité compétente fait exécuter les mesures nécessaires aux frais du propriétaire.
Art. 57. — Le capitaine de tout navire transportant des marchandises dangereuses, toxiques ou polluantes naviguant à proximité ou à l'intérieur des eaux sous juridiction algérienne, est tenu de signaler tout événement en mer survenu à son bord et qui pourrait être de nature à constituer des menaces de pollution ou de contamination du milieu marin, des eaux et des côtes nationales.

Les modalités d'application du présent article sont précisées par voie règlementaire.
Art. 58. — Tout propriétaire d'un navire transportant une cargaison d'hydrocarbures en vrac est responsable des dommages par pollution résultant d'une fuite ou de rejets d'hydrocarbures de ce navire dans les conditions et limites déterminées par la convention internationale sur la responsabilité civile pour les dommages dus à la pollution par les hydrocarbures.

Chapitre 4
Des prescriptions de protection de la terre et du sous-sol
Art. 59. — La terre, le sol et le sous-sol et les richesses qu'ils contiennent en tant que ressources limitées, renouvelables ou non, sont protégés contre toute forme de dégradation ou de pollution.
Art. 60. — La terre doit être affectée à des usages conformes à sa vocation, l'utilisation des terres pour des usages non réversibles doit être limitée.
L'affectation et l'aménagement des sols à des fins agricoles, industrielles, urbanistiques ou autres se font conformément aux documents d'urbanisme et d'aménagement et dans le respect des prescriptions environnementales.
Art. 61. — L'exploitation des ressources du sous-sol doit obéir aux principes qui fondent la présente loi, et en particulier au principe de la rationalité.
Art. 62. — Sont fixées par voie règlementaire :
1) les conditions et mesures particulières de protection environnementale destinées à lutter contre la désertification, l'érosion, les pertes de terres arables, la salinisation et la pollution de la terre et de ses ressources par les produits chimiques ou tout autre matière pouvant altérer les sols à court ou à long terme ;

2) les conditions dans lesquelles peuvent être utilisés les engrais, et autres substances chimiques dans les travaux agricoles, notamment :
- la liste des substances autorisées,
- les quantités autorisées et les modalités d'utilisation afin que les substances ne portent pas atteinte à la qualité du sol ou des autres milieux récepteurs
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Chapitre 5

De la protection des milieux désertiques

Art. 63. — Les plans de lutte contre la désertification doivent intégrer les préoccupations environnementales.

Les modalités d'initiation, d'élaboration et d'adoption de ces plans ainsi que leur contenu et les modalités de leur mise en œuvre sont fixées par voie règlementaire.

Art. 64. — Les modalités et les mesures de préservation des écosystèmes et de la diversité biologique des milieux désertiques, et de compensation de la fragilité et de la vulnérabilité des composants de leur environnement ainsi que les zones concernées par cette protection, sont fixées par voie règlementaire.