Chapter I: Introduction and fundamental concepts:

1. Introduction:

The environment constitutes the foundation of human life and socio-economic development, providing essential resources such as clean air, water, fertile soils, energy, and biodiversity. However, accelerated industrialization, population growth, urbanization, and unsustainable exploitation of natural resources have led to widespread environmental degradation at local, regional, and global scales. Pollution of air, water, and soils, climate change, ecosystem fragmentation, loss of biodiversity, and the accumulation of hazardous waste are among the most critical environmental issues facing contemporary societies. These environmental pressures compromise ecosystem services, threaten public health, reduce agricultural productivity, and hinder long-term sustainable development.

In response to these challenges, environmental protection requires not only scientific knowledge and technological solutions but also strong regulatory and legislative frameworks. Environmental regulations and laws serve as essential instruments for governing human activities that impact the environment. They establish legally binding standards for environmental quality, emissions, resource use, and waste management, while defining responsibilities, enforcement mechanisms, and penalties for non-compliance. In the absence of effective legislation, environmental protection efforts remain largely reactive, inconsistent, and dependent on voluntary initiatives, which are insufficient to address complex and cumulative environmental impacts.

Furthermore, environmental legislation plays a central role in addressing the diverse and interconnected aspects of environmental protection. Regulations concerning air quality aim to control emissions from industrial, transportation, and domestic sources, thereby reducing health risks and mitigating climate change. Water protection laws focus on preserving surface and groundwater quality, regulating wastewater discharges, and ensuring sustainable water use. Soil protection regulations address contamination, erosion, and land degradation, which are critical for food security and ecosystem stability. In addition, biodiversity conservation laws seek to protect natural habitats, endangered species, and ecological corridors, while waste management and chemical control regulations aim to minimize environmental and human exposure to hazardous substances.

Beyond prevention and control, regulatory and legislative frameworks also promote sustainable development by integrating environmental considerations into economic planning and decision-making processes. Instruments such as environmental impact assessments, strategic environmental assessments, and the “polluter pays” principle ensure that environmental costs are internalized and that development projects comply with environmental standards. Moreover, well-designed legislation encourages innovation, investment in clean

technologies, and the adoption of environmentally responsible practices across industrial, agricultural, and urban sectors.

2. Fundamental concepts:

2.2. Environment:

The environment is defined as the set of all natural and artificial elements, as well as physical, chemical, biological, and socio-cultural conditions, that surround living organisms and influence their development, survival, and activities. It includes humans, animals, plants, and microorganisms, along with the ecosystems that connect living communities (biocenosis) to their physical environment (biotope).

From a legal perspective, the concept of environment is intentionally broad. It encompasses natural components such as air, water, soil, atmosphere, fauna, flora, and natural landscapes, but also human-modified environments including urban areas, infrastructure, industrial installations, cultural heritage, and social organization.

The evolution of the concept reflects a shift from a purely naturalistic view to an integrated vision where the environment is understood in relation to human activities and their impacts. Thus, environmental issues include pollution, noise, waste management, land-use planning, energy production, and public health. This comprehensive definition allows environmental law to address complex interactions between nature and society.

2.3. Ecology:

Ecology is a scientific discipline derived from the Greek words *oikos* (house) and *logos* (study). It is the science that studies the conditions of existence of living organisms and the interactions between organisms and their environment. Ecology relies on multiple scientific fields, including climatology, hydrology, geology, chemistry, pedology, biology, and mathematics.

Environmental sciences analyze how natural and human-induced changes affect ecosystems, biodiversity, and human health at local, regional, and global scales. These sciences provide the scientific basis for environmental regulation and decision-making.

2.4. Environmental law:

Environmental law is the branch of law that establishes rules, principles, and institutions aimed at protecting the environment, regulating the use of natural resources, preventing pollution, and ensuring ecological balance. It applies to terrestrial, aquatic, marine, and atmospheric environments and addresses both natural and human-made systems.

This field of law emerged prominently in the second half of the twentieth century, particularly after the 1970s, following major environmental crises and international conferences. Environmental law is characterized by several distinctive features:

- **Preventive function**: It seeks to avoid environmental damage before it occurs, notably through environmental impact assessments, permits, and standards.
- **Corrective and repressive function**: It provides mechanisms for sanctions, remediation, and compensation in cases of environmental harm.
- **Interdisciplinary nature**: Environmental law intersects with civil law, administrative law, criminal law, commercial law, and international law.
- **International dimension**: Many environmental issues transcend national borders, making international conventions and treaties essential sources of environmental law.

2.5. Legislation and regulation:

Legislation refers to the complete body of laws and legal texts in force within a state or related to a specific domain, such as environmental protection. It includes the constitution, parliamentary laws, ordinances, and regulatory acts issued by executive authorities.

Regulation, in contrast, consists of detailed rules and procedures that ensure the practical application of legislation. Environmental regulations specify emission limits, quality standards, technical requirements, authorization procedures, monitoring obligations, and enforcement mechanisms.

While legislation establishes general principles and objectives, regulation operationalizes these principles by defining how activities must be conducted. Environmental regulation therefore plays a crucial role in translating environmental policies into concrete actions and ensuring compliance by public and private actors.

3. Regulatory instruments :

3.1. Law:

The term “law” refers to the set of general and binding rules that regulate social relations, define rights and obligations, and determine what is permitted, required, or prohibited. It’s a general and permanent legal rule adopted by the legislative authority and binding on all members of society. It is the primary source of legal norms and is enforced by public authority. Law is the body of legal rules and norms applicable at a given time. These rules govern the social life of citizens and organize human relationships. Established by competent authorities, they aim to ensure order, justice, and security within the community. Failure to comply with these rules may result in sanctions imposed by the State.

Table 01. Classification of legal Systems (laws)

Type	Definition / Scope	Main Branches	Examples and concerned fields
Private	Governs relationships between private persons (natural or legal) and their interactions.	**Civil Law**	Persons, family, property, obligations, contracts
		Commercial Law	Merchants, company law, banking, competition
		Labor Law	Employment contracts, working conditions, collective labor relations
Public	Governs relationships involving public fiels and between individuals and the State.	**Constitutional Law**	Political organization of the State, functioning of authorities
		Administrative Law	Organization and functioning of public administrations, their relations with individuals
		Public Finance	Budgets, tax collection, public expenditure management
Mixed	Legal disciplines which combines elements of both private and public law.	**Criminal Law**	Offenses and penalties to protect society
		Tax Law	Determination and collection of taxes
		Civil Procedure	Organization of courts and civil proceedings

3.2. Constitution:

The constitution is the supreme legal text of a country. It defines the distribution of powers between legislative and executive authorities and determines which matters fall under the domain of the law and which are governed by regulations. Environmental protection is increasingly recognized as a constitutional principle in many countries.

3.3. Ordinance:

An ordinance is a legal act issued by the executive authority, often with legislative value, to organize specific matters, particularly when authorized by parliament or in urgent situations.

3.4. Decision:

A decision is an act by which a competent authority resolves a specific situation after deliberation. In environmental matters, decisions may concern permits, authorizations, or sanctions.

3.5. Decree:

A decree is a decision taken by the executive authority, having either regulatory or individual scope, and intended to clarify or supplement the legislative framework established by Parliament. It is an administrative act published in the Official Journal of the Republic to ensure its enforceability against citizens, establishing legal rules applicable to all, or having an individual scope (for example, the appointment of a senior public official).

3.6. Order :

An order is a unilateral administrative act, meaning a decision taken by an administrative authority (ministers or mayors) without the consent of those concerned. It may have a general scope, establishing rules applicable to everyone, or an individual scope, such as the appointment of a civil servant. It plays an essential role in the implementation of public policies by specifying the procedures for applying laws and decrees at the local or sectoral level.

4. Environmental management and protection

Environmental management refers to the systematic planning, implementation, monitoring, and improvement of practices aimed at minimizing negative environmental impacts and ensuring compliance with legal and regulatory requirements.

It involves identifying environmental aspects and impacts associated with human activities, analyzing applicable legal obligations, and implementing appropriate control measures. Environmental management systems may be applied at various levels, including industrial installations, municipalities, public institutions, and private enterprises.

Environmental protection encompasses a wide range of regulatory and technical measures related to:

- Protection of air quality and the atmosphere
- Management and conservation of surface and groundwater resources
- Protection of marine and coastal environments
- Soil conservation and prevention of land degradation
- Protection of fauna, flora, and biodiversity
- Control of noise pollution and radiation
- Management of solid, liquid, and hazardous waste
- Regulation of classified and potentially polluting installations

4.1. Fundamental principles of environmental Legislation:

Environmental legislation is based on several universal legal principles intended to guide public policies and judicial decisions:

4.1.1. Principle of monitoring and precaution:

Monitoring makes it possible to alert populations to potential dangers through effective and appropriate communication methods adapted to each type of phenomenon. When an environmental risk is uncertain, measures must be taken to prevent serious damage (Restrictions on GMOs or certain pesticides). It is preferable to act upstream to prevent environmental damage rather than having to repair it afterward (Greenhouse gas emission standards).

4.1.2. Polluter-Pays principle:

"The costs resulting from measures to prevent, reduce, and combat pollution are borne by the polluter of a natural environment." Any individual or company that causes pollution must assume the associated costs (carbon taxes, penalties for industrial pollution). Initially limited to prevention and pollution control costs, this principle was later extended to include the costs of measures taken by authorities related to emissions, and subsequently to environmental liability.

Figure 01: Polluter-Pays Principle

4.1.3. Mitigation principle:

In this context, mitigation refers to the reduction of vulnerability through measures aimed at alleviating the impacts of environmental changes (such as climatic conditions) on society and the environment. It involves

implementing measures designed to reduce major risks and the associated damage resulting from these changes. Public policies often combine adaptation measures with those related to mitigation.

4.1.4. Principle of sustainable development:

Sustainable development is a concept that aims to meet the needs of the present without compromising the ability of future generations to meet their own needs. It is based on a balance between three essential dimensions: economic, social, and environmental. Its objective is to reconcile environmental protection, national economic growth, and the social well-being of citizens, while preserving resources for future generations.

Figure 02: Main Pillars of sustainable development

4.1.5. Principe of conservation:

The principle of conservation in environmental protection emphasizes the responsible management and preservation of natural resources and ecosystems to ensure their sustainability for present and future generations. It involves safeguarding biodiversity, maintaining ecological balance, preventing resource depletion, and promoting practices that reduce environmental impact, such as protected areas, sustainable agriculture, and soil and water conservation. This principle complements sustainable development by ensuring that human needs are met without compromising the environment's ability to support future generations.

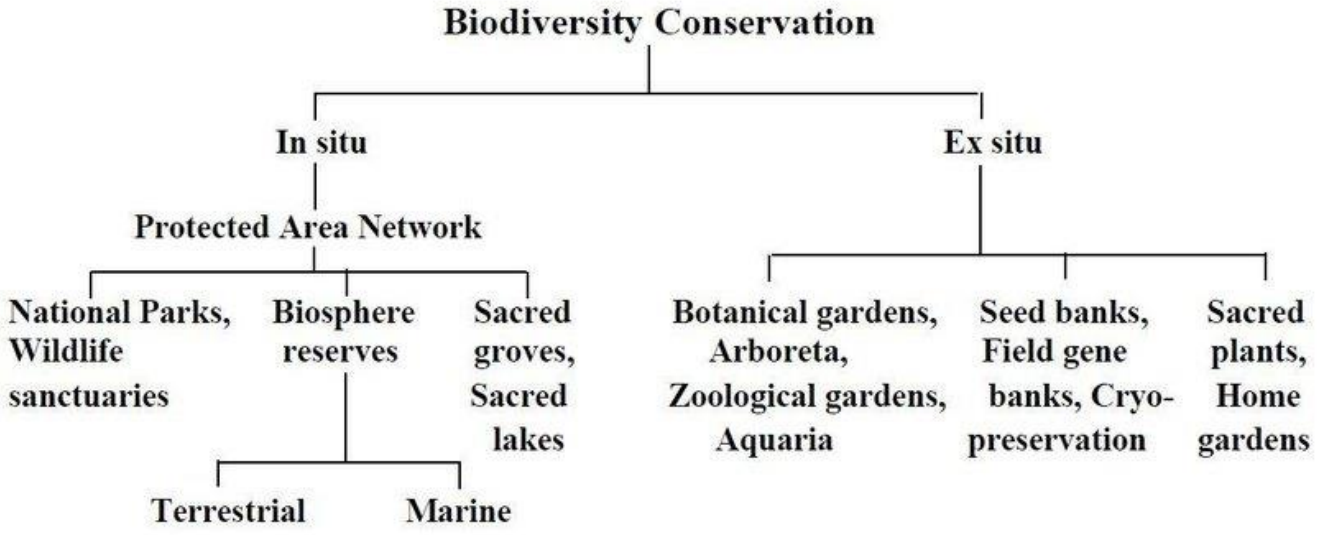

Figure 03. Conservation types for biodiversity protection

4.1.6. Principle of public environmental awareness:

Environmental awareness is based on the idea of protecting the environment through collective awareness and active citizen participation, according to three main actions: informing, educating, and involving. This approach helps change negative behaviors toward our surrounding environment and encourages sustainable practices. Citizens must also be informed about decisions that impact the environment and participate in their implementation on a daily basis.