

Managing administrative control over the risk of chemical pollution on the environment

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Abstract:

Globally, chemical pollution has become a serious threat to sustainable development. Humanity and ecosystems alike suffer from the harmful effects of chemicals through either long-term exposure to low or sub-lethal concentrations of certain chemicals/mixtures of chemicals. This paper discusses the problems associated with unplanned impacts on humans and their food or resources and their lives that are caused by the release of natural occurring and man-made chemicals into the environment through human activities, it talks also about administrative control authorities approved by the Algerian legislator to reduce chemical pollution.

Keywords:environment; chemical pollution;health;biological balance.

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1-Introduction:

The global economic changes in the last quarter of the twentieth century affected most of the world's economies, but the most important of these global economic changes is the exacerbation of environmental problems as a result of pollution and the continuous depletion of resources by institutions, which has become a threat to the ecosystem now and in the future¹.

As a result, a new development policy was found that takes into account the environmental problems that threaten the environment, which is sustainable development that aims to achieve three important aspects: economic effectiveness, social justice, and environmental preservation.

Accordingly, the issue of protecting the environment has become one of the important areas that the corporation is keen to take into account in all its planned projects, considering that it is primarily responsible for environmental pollution due to the waste of its production processes or the use of its products that negatively affect the environment, especially since the urgent necessity to protect the environment has created what is called With a “green wave” that made the natural environment one of the basic variables in the management of institutions²Environmental requirements have now become a traffic license for any product or service traded in the markets.

Accordingly, we will address the following problem: What is the extent of the impact of chemicals on the environment and the protection system approved by the Algerian legislator in this regard?

2-Highlighting the basic concepts:

This topic will review both the concept of the environment and chemical pollution

a. Defining the concept of environment:

¹ -ديب كمال ،عولمة الوعي البيئي ،دار الخلدونية ،الجزائر، 2015، ص.5.

² - محمد عادل عياض ،دراسة نظرية لمحددات سلوك حماية البيئة في المؤسسة ،مجلة الباحث، عدد 07، جامعة قاصدي مرباح ورقلة، الجزائر 2010، 2009، ص11

The term environment takes different concepts. We will try to address the terminological linguistic definition and the terminological scientific concept, as well as the legal concept.

• **The concept of environment in linguistic terminology:**

Dictionaries of the Arabic language have agreed that environment is a word emerging from the verb “bua,” so it is said that about someone has achieved a position among his people and it also has another linguistic meaning that sometimes means home¹.

However, if we return to the concept of environment in Islamic law, we find that the Holy Qur’an referred to the term environment in many verses in the words of God Almighty in verse 56 of Surah Yusuf, peace be upon him: “And thus We established Yusuf in the land to settle therein wherever he wills. We share with Our mercy whomever We will, and We do not waste the reward those who do good.” Likewise, it was stated in the words of God Almighty in verse 74 of Surah Al-A’raf: “And He will take you to the land, and you will take palaces from its plains.”²

It appears to us from the above mentioned that the linguistic meaning of the environment matches the content of the previous two verses. It is said that the environment is the home that the individual occupies, the place that surrounds him, and the environment in which he lives.

• **The concept of the environment in scientific terminology:**

The environment in this scientific perspective means that “the environment is everything that surrounds a person, including living components, such as plants and animals, and non-living components, such as mountains, water, air, and weather..., as another side defines it.” It is the medium or spatial field in which a person lives, which includes natural and human phenomena that he is affected and affected by³.

“Environment refers to the totality of external conditions that surround human beings in a certain interrelationship that exists between them and

¹ - محمد مرسى محمد مرسى ،الاسلام ،والبيئة ،اكاديمية نايف العربية للعلوم الامنية ،الطبعة الاولى،الرياض،السعودية،1999،ص.18

² - علي سعيدان ،حماية البيئة من التلوث بالمواد الاشعاعية و الكيماوية في القانون الجزائري،دارالخلدونية،الجزائر،2008،ص.5

³ علي سعيدان المرجع السابق،ص.6

between humans, other living organisms, plants, microorganisms and property.”¹

• **The concept of the environment in Algerian legal terminology:**

The environment consists of abiotic and biotic natural resources such as air, atmosphere, water, land, subsoil, plants and animals, including the genetic heritage and forms of interaction between these resources, as well as places, views and natural landmarks².

b. The concept of chemical triad :

Chemical pollution is defined as the presence or increase in our environment of chemical pollutants that are not naturally present there or are present in quantities higher than their natural values. Most of the chemicals that pollute the environment are man-made, resulting from various activities in which toxic chemicals are used for different purposes.

Chemicals in their gaseous, liquid, and solid states that are characterized by their potency, toxicity, or susceptibility to explosive or corrosive events, or that have other properties that can lead to a risk to the environment and public health, whether alone or when connected with other substances. There is no doubt that industry is one of the most important sources of production of chemical pollutants in our world today due to the multiplicity of industries and the tremendous progress in the industrial application of modern science, which is known as technology, It is considered one of the most important chemical pollutants produced³.

Chemical pollutants resulting from industry have the ability to accumulate in the body of living organisms and reach the point of toxicity⁴.

¹-Anil Kumar, BRIEF INTRODUCTION OF ENVIRONMENT, ECOLOGY AND ENVIRONMENTAL POLLUTION, Inspira- Journal of Modern Management & Entrepreneurship (JMME), Volume 08, No. 01, January, 2018, pp. 314-322

²- انظر المادة 04 من القانون رقم 03-10 بتاريخ 2003/07/19 المتعلق بحماية البيئة في اطار التنمية المستدامة ، ج، ر رقم 43 الصادر بتاريخ 2003/07/20، ص.10.

³-Dr. Mahmoud S. Muter, Chemical Pollution, <https://www.uoanbar.edu.iq/eStoreImages/Bank/9195.pdf>

⁴-Ravi Naidu a,b,*,1, Bhabananda Biswas b,c,1,2, Ian R. Willett d, Julian Cribb e, Brajesh Kumar Singh f, C. Paul Nathanail g, Frederic Coulon h, Kirk T. Semplei, Kevin C. Jones i, Adam Barclay

2-The harmful effects of chemical pollution on the environment and administrative control mechanisms to confront it :

Failure to manage chemicals correctly and properly would negatively affect human health and the environment, and this is what will be discussed in this topic.

a. Areas of environmental protection from chemical pollution :

Protecting the environment must include all its branches, no matter how different the nature of the latter is, because the predominance of a certain field will move to another field. Therefore, concern for its protection must not be limited to one branch of the environment without the other.

•Protecting the ambient air:

The air environment means atmosphere that completely surrounds the Earth, and includes a group of gases, some of which remain almost constant, such as oxygen and nitrogen, and some of which are unstable and change from one place to another, such as carbon dioxide and ozone¹. Although there are many causes of air pollution, they can be examined in two groups: naturally occurring air pollution and man-made air pollution. Carbon dioxide, nitrogen oxide, and chlorofluorocarbon dioxide are the pollutants caused by artificial air pollution. As a result, emissions from vehicles, fuel oils and natural gas for heating homes, byproducts of manufacturing and power generation, especially coal-fired power plants, and fumes from the production of chemicals may occur. Natural causes are forest fires, desert dust, and the decline of animal and plant species. The origins of human-caused air pollution also go back to the establishment of many factories with industrialization and the formation of unplanned urbanization with migration from village to city due to the need for labour. However, some international initiatives and agreements have been put forward to solve environmental problems and provide a better quality of life. Among these trends is the Stockholm Conference on the Human Environment, which was organized by

b, Robert John Aitken j,k, Chemical pollution: A growing peril and potential catastrophic risk to humanity, *Environment International* 156 (2021) 106616,p.01.

¹-Dr. Sangeeta Bajpai and Dr. Monika Kamboj, Harmful Chemicals: Impact on Environment., *International Journal of Advanced Research* (2016), Volume 4, Issue 5, 1800-1806.

the United Nations in 1972, where the conference met to find solutions to environmental problems that occur on a global scale. After the conference concluding several relevant conventions were concluded

Among them is the Convention concluded in Geneva on November 13 in 1979, relating to air pollution¹ that defines air pollution as changing air or air pollution means inserting human beings directly or indirectly into materials or energy in the air or air and having a detrimental effect, and posing a risk to human health². The Algerian legislator defines air pollution as the introduction of any substance into the atmosphere due to the emission of gases, vapors, smoke, or liquid or solid particles that would cause damage and danger to the standard of living³. The above-mentioned contaminants result in a range of damage to the air environment, including: air pollutants lead to diseases such as chest disease, allergies, skin cancer and DNA damage that kills genetic traits, weakness of the immune system, early aging, blood poisoning and neurological fatigue, eating water channels and mineral equipment that store drinking water taken from these reservoirs.

•Protection of the aquatic environment:

The marine environment has unique characteristics that distinguish it from other elements of nature. As the seas and oceans cover more than two thirds of the Earth's area, they play a vital role in achieving biological and climate balance on the planet. The marine environment also plays an important role in human life, possessing many food and industrial resources that directly affect human well-being. It also contains vast quantities of oil and natural gas, which has played a role in the world's economic prosperity. The seas are also a source of freshwater through the use of seawater desalination in States with a lack of freshwater resources. In addition, the marine environment is an important source of human food and other

¹-EmrahAtar,Managing Air Pollution in International Environmental Policies: Covid-19 as a Case to Demonstrate the Impact of Human on Environment,Journal of Academic Value Studies,7(2) (2021) 63-72

²نقلا عن خالد العراقي، البيئة تلوثها وحمايتها، الطبعة الاولى، دار النهضة العربية، القاهرة، 2011، ص.49.

³انظر المادة 04 من قانون رقم 10-03 مؤرخ في 19 جويلية 2003 المتعلق بحماية البيئة المستدامة، السالف الذكر.

organisms¹In 1961, the World Health Organization defined freshwater pollution as a change in the composition of its components or a change in its condition directly due to human activity so that such water would be less suitable for natural uses intended for it or some of them. Article 04 of the Algerian Environment Act of 2003 specifies that water pollution is the insertion of any substance in the water environment that alters the physical or biological characteristics of water. Oil pollution is one of the most polluting sources of the aquatic environment. The mixing of oil or oil with water seriously affects environmental balance. The latter occurs either through compelling marine disasters that occur to ships, oil tankers and offshore installations following a collision between petroleum vessels, through the delinquency of such tankers, or due to the crash of offshore oil extraction facilities. In addition, there is contamination resulting from nuclear radiation due to deliberate nuclear explosions in the field of nuclear testing, in addition to contamination with household contaminants, as well as dumping contamination, which is deliberate discharge of waste from ships, aircraft or pavements².

Pollution of the aquatic environment also leads to the spread of bacteria, viruses, and pathogenic microorganisms in the water, which leads to a group of health risks and sometimes the incidence of some epidemic diseases such as schistosomiasis, dysentery, cholera, typhoid, hepatitis, polio, leishmaniasis, and others.

Nitrogen oxide and sulfur emissions from industry and cars cause acidic rainfall that poisons fish and other aquatic organisms in rivers and lakes³

•Protecting the Earth's Environment :

Most of the world's countries have enacted laws to protect the Earth's environment from pollution. Algeria, like others, has promulgated several laws that preserve the Earth's soil and its components, including the following:

¹-Yousef H. Almutairi, Protection of The Marine Environment Under International Law and Kuwaiti Criminal Law, <https://digitalcommons.pace.edu/lawdissertations>

²- محمددي محمد الامين ،قوسم الحاج الغوتي ،التلوث البيئي البحري على ضوء القانون الدولي ،مجلة البحوث العلمية في التشريعات البيئية، العدد التاسع ، جامعة بن خلدون تيارت ، جوان 2017 ص.436،437

³-Dr. Sangeeta Bajpai and Dr. Monika Kamboj, op.cit.

Decree No. 86-132 of 27 May 1986 protecting workers from ionizing radiation hazards and the rules on control of the acquisition and use of radioactive materials and devices generating ionizing radiation and other laws protecting the Earth's environment from all forms of pollutants The Algerian legislature also refers to the need to protect the Earth and the subsoil of the Earth under the Environmental Protection Act in the context of sustainable development¹.

Pollution of the terrestrial environment results from the addition of components of materials or formulations that are foreign to them and exceed the percentage of salts than usual. The terrestrial environment is contaminated by chemical pesticides used in the fields of agriculture and public health to eliminate various pests, including parasites that are dangerous to humans, but in contrast they negatively affect the organisms in the soil and contribute to the contamination of groundwater and dairy products².

Also, the unaccounted and excessive use of phosphate and nitrogen fertilizers would raise the percentage of both phosphate and nitrate compounds in this water.

Chemical weapons used during wars and conflicts are among the most important sources of pollution of the terrestrial environment because of their effect on living organisms, on the formation of agricultural soil, and on the contamination of groundwater sources. In addition, there is the so-called phenomenon of desertification, which is considered among the problems that harm the terrestrial environment, as it leads to damage to the terrestrial environment. It is dangerous for soil fertility, water withdrawal, and deterioration of its suitability for agriculture³.

Pollution of the terrestrial environment negatively affects agricultural crops because they contain chemical residues. It also negatively affects surface water and wild organisms in the form of direct or indirect poisoning,

¹ - راجع المادة 59، 68، من قانون 03-10 المتعلق بحماية البيئة في اطار التنمية المستدامة، المرجع السابق ذكره

² - Dr. Sangeeta Bajpai and Dr. Monika Kamboj, op, cit.

³ - رعب الهادي حسن ، حماية البيئة من التلوث بالمبيدات الكيماوية و افضل الحلول، الطبعة الثالثة، دار علاء الدين دمشق ، سوريا، ص. 7.

in addition to the entry of chemical pesticides into groundwater, which is the greatest danger to the environment and humans.

b. The role of environmental management control in protecting against chemicals:

In the field of environmental control, the Department of Environmental Control is responsible for setting standards and levels that are prohibited from exceeding them for nature's pollutants, issuing the necessary licenses to deal with environmental elements, preparing implementing regulations for environmental protection laws, and using the mechanisms necessary for direct implementation in order to take the necessary measures to preserve the environment such as the closure of the place of activity or the treatment of environmentally harmful waste at the expense of the administrator, and the maintenance of public health.

•Environmental administrative control authorities:

Environmental administrative control ensures the preservation of the general environmental system, which is a set of rules that are considered restrictions on the right to dispose of the components of the environment.

Absolute prohibition: It represents the complete prohibition of certain actions that have negative effects on the environment, without a license or exception. As an example of an absolute prohibition, we find Article 51 of Law 03-10 related to environmental protection, where the Algerian legislature acknowledges that it prohibits pouring wastewater in the water intended for the resupply of aquifers and in the wells and drilling and wastewater attracting unallocated water¹.

Relative prohibition: It is necessary to take a license in certain actions that are likely to cause damage to the environment. Algerian legislation recognizes the need to respect Algeria's urban economic rules and does not prejudice environmental balances. In addition, article 110 of the Municipal Code affirms that the President of the Municipal People's Council shall ensure the protection of peasant lands and green spaces, particularly when various projects are being set up on the municipal territory, Article 114 of the

¹ - بوقرط ربيعة، فاعلية الضبط الإداري البيئي في تحقيق الأمن البيئي في التشريع الجزائري الأكاديمية للدراسات الاجتماعية والإنسانية، عدد 20، جوان 2018، ص.245.

Municipal Code indicates that the establishment of any project likely to harm the environment and public health on the municipal territory with the approval of the Municipal People's Council except for projects of public interest that are subject to environmental protection provisions project ", with a brief study certificate on the impact on the environment in development projects¹.

In view of the increasing phenomenon of environmental deterioration due to the accumulation of solid waste, the Algerian legislator issued Law No. 01/19 of December 12, 2001, the Waste Management, Control and Removal Law, establishing a public body charged with monitoring, sorting, transporting, valorizing and removing all waste, and special conditions apply to it, namely the selection of sites for the establishment of waste treatment facilities in order to prepare it, complete it, modify its work, and expand it to the organization related to studying the impact on the environment, where facilities or institutions must respect the following procedures:

A license from the Minister in charge of the environment for private waste, a license from the regionally competent governor for private waste, a license from the regionally competent municipal popular council for waste. If the termination of exploitation or final closure of the facility is resolved, the owner of the establishment is obligated to return the place to its original state or to the state determined by the competent authority. In this regard, the Algerian legislator added Executive Decree No. 03-478 specifying the methods of managing the waste of therapeutic activities according to imperative rules, as it was granted to the public authorities. Public authorities are granted the privilege of requiring licensing in any special plant for the treatment of infectious wastes in accordance with article 26 of the same decree².

¹ - عمري احمد ،سلطات الضبط الاداري في مجال حماية البيئة مجلة البحوث العلمية في التشريعات البيئية ،العدد التاسع ،جوان 2017،جامعة ابن خلدون تيارت 2017، ص. ص7 و8

² - الطاهر دلول ،موسى نورة ،الضبط البيئي وتأثيره على حقوق الانسان ،مقال غير منشور ،دون ذكر مداخلة في اي ملتقى،ص.ص6 و7.

The obligation: is to carry out positive action that contributes to protecting the environment and protecting it from the dangers of pollution. An example of this is what is included in Article 32 of Law 01/09 relating to the management, control and removal of waste. If waste is brought into the national territory illegally, the Minister in charge of the environment must order its possessor or transporter to ensure its return to the country of origin within a period determined by the Minister. The Algerian legislator, according to Mines Law No. 01/02, requires the holder of the mining title or the holder of a license to exploit stone and sand quarries to establish a system to prevent serious dangers that may result from his activity.

A license is permission from the competent administration to practice a specific activity that is not permitted to be practiced without permission, given that the organization's activity may have a negative impact on the environment. The latter takes various forms, including:

▪ **License to exploit classified facilities - the institution – :**

The Algerian legislator divided classified establishments into two types: classified establishments subject to licensing and establishments subject to a permit. The first is considered more dangerous to the environment, and they are three types: The first category is subject to the license of the Minister in charge of the environment, for example the license of the Minister in charge of private waste, while the second category is subject to the license of the governor, example of the governor's license in relation to household waste. As for the third and final category, it is subject to the President of the Municipal People's Council, for example the license of the President of the Municipal People's Council in relation to dead waste. As for the facilities subject to the permit, which are the facilities that do not pose a threat to the environment, the permit is issued by the head of the municipal people's council after the facility owner provides the relevant information.

▪ **Casting License:**

Algerian legislator organized the casting process to preserve water resources Water Law No. 05/12 of 04/05/2005 prohibits any operation relating to the disposal, discharge or pouring of any substance in the property of the public property of water; Especially city secretions and factories

containing solid, liquid or gaseous materials or agents generating damage that may affect the quantity and degree of public health, livestock and vegetation, or damage economic development¹.

▪ **Reporting system:**

a new method introduced by Algerian legislation in line with the international environmental system ", since the purpose of this system is to have the right to continuously and indirectly control the granting of a license to the enterprise that is entrepreneurial, For example, article 21 of the Waste Management Act No. 01/19 requires possessors of hazardous special wastes under penalties to submit a permit to the Minister for the Environment containing information on the nature, manner and characteristics of the wastes, etc.².

▪ **The Environmental Impact Study System:**

It is an essential means of enhancing environmental protection. It aims to identify and assess the direct and indirect consequences of projects on environmental balance, as well as on the framework and quality of life of the population. The Algerian legislator subjected the authorization to exploit the classified facility to submit the study of the impact. In advance and depending on the case, It undergo a study of the impact or summary of the impact on the environment, development projects, structures, installations, factories, other artworks, all works and construction and preparation programs that directly or indirectly affect the environment immediately or later, especially species, resources, circles, natural spaces, ecological balances, framework and quality of living³.

Algerian legislature organized the issue of assessing the impact of environmental impacts of development projects, through its executive study of environmental impact No. 90-78, which was amended by the new Executive Decree No. 07-145 establishing the area of application, content and qualifications of certifying a study and the summary of environmental

¹ - بوقرط ربيعة، المرجع السابق، ص.ص. 246، 247.

² - نفس المرجع، ص. 247.

³ - احمد لكحل، النظام القانوني لحماية البيئة و التنمية الاقتصادية المستدامة، الطبعة الثانية، دار هومة، 2016، ص. 289.

impact on the study and summary of environmental impact, which shows how to study the impact of development projects on the environment¹.

• **Deterrent Procedures for Environmental Administrative Control:**

The Law on Administrative Control grants a set of deterrent machinery for preserving the environment and preventing it from damaging pollution.

▪ **Alert and warning :**

Alert is the lowest degree of administrative sanctions that can be imposed on anyone who violates environmental protection laws. Where an editorial book is directed containing infractions or infractions that are installed by environmental control agencies, The gravity and severity of the penalty that may be imposed in case of non-compliance For example, the governor makes an excuse for the third party's starch operator in the list of listed establishments that give rise to environmental hazards and sets a time limit for taking the necessary measures to remove such hazards².

▪ **Temporary closure:**

If the enterprise owner or enterprise does not give attention to the warning given to him The Administration has temporarily closed this institution or establishment for a fixed period of one or a few months, As a punishment for the entrepreneur, the closure leads to the cessation of the activity and the possible serious financial loss that may cause him next time to take caution in any future projects that may affect environmental security. s legislation in article 25 of Act No. 03-10 on environmental protection and sustainable development: If the user fails to comply on time, the enterprise shall be interrupted until the conditions imposed are implemented, with the necessary interim measures, including guaranteeing payment of users' dues of any kind.

▪ **Withdrawal of the license:**

¹ - المرسوم التنفيذي رقم 78-90 رقم 78-90 المؤرخ في 27 فيفري 1990 المتعلق بدراسة التأثير في البيئة ج.ر. عدد 10، المرسوم التنفيذي رقم 145-07 المؤرخ في 19 ماي 2007 المحدد لمجال وتطبيق ومحتوى وكيفيات المصادقة على دراسة وموجز التأثير على البيئة، ج.ر. 34.

² - راجع المادة 25 من القانون رقم 10/03 المتعلق بحماية البيئة و التنمية المستدامة.

The withdrawal of the license from the legitimate projects is one of the inherent rights of the administration. The latter withdraws each license from each project that violates environmental protection rules, and does not bring its activity into conformity with the legal standards of the license. For example, article 87 of the Water Act No. 05/12 stipulates that if the license holder or concessionaire does not observe the use of water resources for the conditions and privileges provided for by law, the license or concession shall be revoked.

▪ **Fine:**

It is a sum of money that the administration expects for each perpetrator of an environmental offence causing pollution to the environment. The legislator determines the minimum and maximum fine and leaves the administrative authorities with discretion to impose the appropriate penalty for environmental pollution. This levy consists of several fees called environmental fees¹.

First, the fiscal fees:

Drawing on activities contaminated or dangerous to the environment: imposed on activities contaminated or dangerous to the environment approved by the Algerian legislature under the Finance Act 2000 in the following way: 120000DZD for enterprises classified as authorized by the Minister of Environment 24000DZD if not occupied in more than two years' time; 90000DZD For the classified plant subject to the license of the regionally competent governor, this amount is reduced to 18000g if you have not occupied more than two years.

Collection of waste management:

The collection of urban household waste, the management of industrial waste on contaminated activities, and the collection of waste management associated with hospitalization activities.

Collecting air pollution: collecting air pollution from car traffic, collecting fuel specified under the 2007 Finance Act.

¹ - هشماوي اسيا،اليات تدخل سلطات الضبط الاداري في الحماية البيئية،الرقابة البعدية،مجلة افاق الفكرية،العدد الرابع،شتاء

Collecting water pollution: The following include collecting sewage, collecting industrial-sourced wastewater, collecting the passage of ships and ships in the Mediterranean Sea¹.

Second, the Algerian legislature seeks, through this principle, to eliminate the burden of the social cost of pollution on which it creates. It is a form of financial pressure on the polluter to refrain from any activity that pollutes the environment or at least reduces the amount of pollution resulting from its industrial or technological activity².

In addition to the foregoing, the Algerian legislature has provided for penalties for deprivation of liberty, since the penalty of imprisonment has been used extensively. It is the penalty prescribed for most offences of contamination of the environment. There is a minimum of 10 days, depending on the nature of the offence to five years' imprisonment provided for in various environmental legislation³.

Conclusion

Chemicals are everywhere and in all materials, and the global impact of chemicals on the environment is multifaceted. Chemical toxicity and heavy metal poisoning not only cause toxins to accumulate in human tissues and organs leading to environmental imbalances, and through the above we have reached the following results:

- The substantial use of chemicals is essential for achieving the social and economic objectives of the global community and can be used with a high degree of safety when following best practices.
- There is insufficient scientific information to assess risks,
- Lack of resources to assess chemicals for which data are available.

The recommendations are as follows:

- Expansion and acceleration of the international chemical risk assessment;
- Harmonization of classification and labelling of chemicals;

¹ - بوقرط ربيعة، المرجع السابق، ص249.

² - انظر المادة 3 من قانون 10-03 المتعلق بحماية البيئة في اطار التنمية المستدامة

³ - احمد لكحل، المرجع السابق، 305، 306.

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