

THE LEGAL FRAMEWORK OF ENVIRONMENTAL PROTECTION FROM THE RISKS OF GENETICALLY MODIFIED ORGANISMS (GMOS)

SADIKA BESSOUF¹, ABDERZAG SAHRAOUI²

¹University Center of Barika, Governance Prospects Lab for Sustainable Local Development (Algeria).

²University of Batna 1 (Algeria).

The Author's E-mail: sadika.bessouf@cu-barika.dz¹, abderzag.sahraoui@univ-batna.dz²

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Abstract:

The subject of the legal framework for environmental protection from the risks of genetically modified organisms (GMOs) aims to address international conventions and national laws regulating the use and trade of GMOs. This paper encompasses the regulation of the trade of these organisms within the context of the relationship between international trade and the environment. It discusses the Convention on Biological Diversity and the Cartagena Protocol on Biosafety, and the inherent conflicts with the provisions of the TRIPS Agreement on Trade-Related Aspects of Intellectual Property Rights of 2005, as amended in 2017, which delineates the necessary conditions in national laws related to intellectual property. It also examines the legislative and regulatory texts governing the use of genetically modified organisms in Algerian legislation, with the objective of assessing the effectiveness of the law in mitigating the potential negative impacts of the use and trade of GMOs on the environment.

Keywords: Genetically Modified Organisms; Environment; International Trade; Biological Diversity; Biosafety.

INTRODUCTION

Environmental issues have been of significant academic and official interest for over half a century at both the international and national levels, aiming to avert the risks facing the natural environment and human health. Environmental security is considered a fundamental dimension of human security, according to the Human Development Report of the United Nations Development Program for 1994.

Derived from the principle of the human right to live in dignity and enjoy their natural rights enshrined in international human rights treaties, including the right to health, physical safety, and the right to food, biological security is one of the most critical elements of environmental and health security. This is due to the direct impact of environmental damage on public health, necessitating the provision of necessary protection for individuals and communities from biological risks, including infectious diseases, biological toxins, and Genetically Modified Organisms. The latter is the subject of our intervention entitled "The Legal Framework of Environmental Protection from the Risks of Genetically Modified Organisms" through which we attempt to address the following problematic:

To what extent is international and Algerian law effective in providing the necessary protection for the environment from the risks of genetically modified organisms?

To answer this problem, we have adopted the following plan:

First Axis: The Concept of Genetically Modified Organisms

Second Axis: Regulation of the Trade of Genetically Modified Organisms in International and Algerian Legislation

First Axis: The Concept of Genetically Modified Organisms

Understanding the concept of Genetically Modified Organisms requires addressing this term by definition first, defining the associated concepts second, then discussing their benefits and drawbacks.



First - Definition of Genetically Modified Organisms

Article 3 of the Cartagena Protocol on Biosafety, attached to the United Nations Convention on Biological Diversity of 1992, defines genetically modified organisms as "any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology."¹

We can define genetically modified organisms as organisms whose genetic characteristics are altered using specific and precise techniques called genetic engineering, including plants, animals, and microorganisms. They are used in various fields such as agriculture, medicine, industry, and others.

Second - Definition of Some Concepts Related to Genetically Modified Organisms:

1. Genetic Engineering

Engineering involves designing and planning to achieve a specific goal. Genetics, on the other hand, is the science that studies how hereditary traits are passed between successive generations of living organisms, as well as studying the similarities and differences among individuals of the same species.²

Genetic engineering means directing the natural path of genetic factors "genes" towards another path to change an unwanted reality or achieve a desired description.³ It is a theoretical concept of understanding more likely by social science scholars.

From an applied perspective, it is a scientific term that refers to one of the biotechnology techniques used for the direct manipulation of genes to change or control them by deletion, addition, rearrangement, or fusion, by transferring the genes responsible for them in the cells of the organism carrying the trait to the targeted cells,⁴ using precise operational techniques proportional to the size of the cell, called "genetic modification". It differs from traditional methods such as hybridization, with the aim of changing the hereditary traits to obtain new plants or animals carrying specific desired traits.

2. Biotechnology

The United Nations Convention on Biological Diversity of 1992, in paragraph 3 of its second article, defined biotechnology as "any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific uses."⁵

The Organization for Economic Co-operation and Development (OECD) defines it as "the application of science and technology to living organisms, as well as their components, products, and designs, to modify living material or non-living material to produce knowledge, goods, and services."⁶

¹ - Article 3 of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, adopted in Montreal on January 29, 2000, ratified by Algeria pursuant to Presidential Decree n° 04-170, dated June 8, 2004, Official Gazette of the Republic of Algeria, N° 38, issued on June 13, 2004.

² - Boumediene Muhammad and Bekhni Ahmed, Precaution against genetically modified materials within the framework of consumer protection, Al-Ustad Al-Bahith Journal for Legal and Political Studies, Vol. 2, N° 2, issued on 06-01-2017, pp. 92-93.

³ - Mahmoud Abdel Rahim Mahran, Provisions of Genetic Techniques Aiming at Modifying Genetic Characteristics in Humans, Conference on Genetic Engineering between Sharia and Law, May 5-7, 2002, College of Sharia and Law, United Arab Emirates University, pp. 178-179.

⁴ - Ibid., pp. 251-252.

⁵ - Paragraph 3 of Article 2 of the United Nations Convention on Biological Diversity, signed in Rio de Janeiro, on June 5, 1992, ratified by Algeria pursuant to Presidential Decree n°. 95-163 of June 6, 1995, Official Gazette of the Republic of Algeria, N° 32, issued on June 14, 1995.

⁶ - Biotechnology is "The application of science and technology to living organisms, as well as to its components, products and models, to modify living or non-living materials for the purposes of production of knowledge, goods and services. », Official Website of the Organization for Economic



According to these definitions, biotechnology is the application of science and technology to living organisms or parts of them to obtain commercially valuable products.

3. Genetic Factor (Gene)

It is the element responsible for carrying and transmitting hereditary traits from generation to generation, consisting of a series of DNA nucleotides. It is the functional unit of DNA.⁷

4. Deoxyribonucleic Acid (DNA)

Deoxyribonucleic acid (DNA) is the main genetic material carrying information and hereditary traits, controlling their translation and expression. It is the main component of chromosomes (chromosomes) found within the cell nucleus.⁸

5. Chromosomes

Chromosomes are derived from the Greek language, composed of two parts: Chroma meaning color and Soma meaning body. They are twisted thread-like particles carrying genes inside the cell nucleus and capable of self-replication and maintaining their functional and structural characteristics during cell division.⁹

Third - Benefits and Harms of Genetically Modified Organisms

Due to the wide-ranging controversy surrounding genetically modified organisms in scientific circles, given their environmental and health implications, some positive and negative impacts must be highlighted:¹⁰

Benefits of Genetically Modified Organisms:

- Increased agricultural productivity: by improving crop plants and increasing their resistance to pests, diseases, and climate changes, thereby increasing agricultural production and providing more food.
- Improving food quality: Plants and animals can be modified using genetic engineering technology to enhance their nutritional value, such as increasing the content of essential vitamins or minerals.
- Reducing dependence on pesticides: Through genetic engineering technology, plants can be developed that are resistant to pests or converted to produce natural pesticides, reducing the need for harmful chemical pesticides.
- Discovering many genetic diseases and their causes and treatment methods: such as sickle cell disease.
- Improving pharmaceutical products: Genetic modifications can be made to living organisms to produce drugs and vaccines more efficiently and effectively, contributing to the development of new treatments for diseases.
- Making animals more resistant to viruses: by introducing some genes into them.
- Increasing the growth rate in animals: by providing them with rapid growth hormones.
- Protecting endangered animals.
- Removing environmental pollution: through biological treatment by producing bacteria that break down waste, and others that degrade oil molecules leaked

Potential Risks of Genetically Modified Organisms (GMOs):

- Environmental Risks: Genetic engineering technologies raise concerns about their impact on biological diversity and ecosystems, which may lead to undesirable changes in the natural environment.

Co-operation and Development OECD, Statistical definition of biotechnology (updated in 2005), Link: <http://bitly.ws/KaSW>, Visited on May 11, 2023, at 7 p.m.: 30 mins.

⁷ - Mahmoud Abdel Rahim Mahran, *Ibid.*, pp. 243, 247.

⁸ - *Ibid.*, p. 247.

⁹ - Ontime news website, link: <http://bitly.ws/FCKI>, Visited on May 02, 2023, time: 13:00.

¹⁰ - Mawdoo3 website, link: <http://bitly.ws/FDcK>, Visited on May 26, 2023, at 18:20.



- **Health Impact:** There are numerous concerns regarding the long-term effects of consuming genetically modified foods on human health. The use of added genetic materials may result in unexpected reactions or unknown side effects.
- **Overreliance on Large Companies:** The development and use of genetically modified organisms are associated with major companies specialized in the agricultural industry. This may exacerbate their control over supply and reliance entirely on specific seeds and crops, thus monopolizing their production.
- **Concerns about Transparency and Consumer Rights:** Consumers face difficulty in determining whether products contain genetically modified components or not, leading to concerns about transparency and the consumer's right to information regarding genetically modified products.
- **Potential dangers related to GMO'S Cross pollination:** Using GMO's can lead to a mixed pollination between the local species and GMOs posing new challenges for the local farmers and new species that can outperform the local species in the natural selection of the ecosystem.
- **Resistance development:** Exposing GMO'S to the local species of Fauna and Flora will eventually make them resistant to the GMO's which will force farmers to use unhealthy amounts of pesticides and herbicides to get rid of these new developed local species.
- **The degradation of the local biodiversity:** Generally, GMO'S out-compete the local species at all levels leading to the loss of the local species.

It is essential to consider both the advantages and disadvantages mentioned above when evaluating the potential use of genetic engineering technology. Regulation and organization from a legal standpoint are necessary to ensure environmental and health safety overall.

Second Axis: Regulating the Trade of Genetically Modified Organisms in International and Algerian Legislation

The legal framework for the use of genetic engineering technology requires addressing international agreements governing the use of genetic engineering first and the national legal and regulatory texts of Algeria secondly.

1. Regulating the Trade of Genetically Modified Organisms in International Agreements:

The regulation of genetic engineering technology in international law has passed through four main stages. The first stage involves linking international trade to environmental considerations. The second stage concerns the adoption of the United Nations Convention on Biological Diversity in 1992. The third stage involves the adoption of the Cartagena Protocol on Biosafety in 2000, which is annexed to the same convention, as well as the Nagoya Protocol in 2010 on Access to Genetic Resources:

1. Regulating the trade of genetically modified organisms within the framework of the relationship between international trade and the environment:

Since the late 1980s, the United States has been calling for a link between environmental protection and international trade within the framework of the General Agreement on Tariffs and Trade (GATT) of 1947. This demand faced significant opposition from developing countries due to their concerns about imposing environmental restrictions and requirements that would hinder access to international markets for their products. They emphasized the need to ensure sustainable development within the provisions of the convention in case this link between international trade and the environment was endorsed, to combine the three dimensions represented by trade, environment, and development.

By establishing the Trade and Environment Committee on January 30, 1995, pursuant to the decision of the Trade Ministers of the World Trade Organization issued on April 15, 1994, the committee's jurisdiction was defined, the most important of which are:¹¹

¹¹ - Official Website of the Food and Agriculture Organization (FAO), Link: <http://bitly.ws/KaTd>, Visited on May 09, 2023 at 5:45 p.m.



- A. Investigating the relationship between provisions of multilateral environmental agreements and the organization's trade rules;
- B. Studying the impact of using environmental standards on access to global markets, especially for developing countries;
- C. The issue of exporting products prohibited from local trade;
- D. Investigating the potential conflict between environmental elements, including genetically modified organisms, and trade freedom.

It is worth mentioning that the United States, which was demanding the linkage between international trade and environmental protection, has abstained from imposing international trade restrictions on genetically modified foods because it does not serve its economic interests.

2. United Nations Convention on Biological Diversity for the year 1992:

The signing of the United Nations Convention on Biological Diversity on June 5, 1992, was one of the most important results of the Earth Summit in Rio de Janeiro on Environment and Development in 1992.

The convention aims to preserve biological diversity, use it sustainably, and enhance access to genetic resources and fair and equitable sharing of the benefits arising from their use. The convention encompasses the establishment of an institutional framework represented by the Conference of the Parties (COP) as the supreme authority of the convention, which holds regular meetings every two years to discuss issues of biodiversity, and to determine relevant policies and future actions.¹² Additionally, it establishes an international secretariat based in Montreal, Canada, concerned with biodiversity, tasked with monitoring the implementation of the convention's provisions and its work programs. The committee has undertaken the development of mechanisms for scientific research and international cooperation in the field of biodiversity conservation.¹³

Among the most important issues addressed by the convention is the topic of biosafety, aiming to protect the environment and human health from the potential harmful effects that may result from the trade and consumption of biotechnology products, including genetically modified organisms (GMOs)¹⁴, despite the potential contribution of this technology to fulfilling human basic needs, as previously mentioned.

It is noteworthy that the United Nations Convention on Biological Diversity of 1992, while encouraging its parties to facilitate access to technology transfer, including biotechnology, also calls on them to take necessary measures to ensure the safety of this technology and to prevent its risks to biodiversity and human health.

The Cartagena Protocol on Biosafety of 2000

In application of the provisions of the convention and to achieve its objectives, the Conference of the Parties established, under its decision 2/5, an open-ended working group dedicated to biosafety, tasked with preparing a protocol on biosafety supplementary to the convention.¹⁵ The group embarked on negotiations lasting three years, during which two blocs emerged: The first composed of importing countries of genetically modified products, mostly from developing countries, advocated for the establishment of a strict protocol to protect the environment and human health without neglecting the potential impacts on international trade. The second bloc consisted of six countries exporting these products, owned by major companies utilizing genetic engineering technology, including the United States, Canada, Australia, Chile, Uruguay, and Argentina. However, these negotiations failed to reach consensus on the protocol's provisions due to the insistence of food-producing countries on drafting lenient provisions from an

¹² - Article 23 of the United Nations Convention on Biological Diversity, *Ibid*

¹³ - Article 24, *Ibid*.

¹⁴ - 3rd paragraph of Article 19, *Ibid*.

¹⁵ - United Nations Audiovisual Library of International Law website, Link: <http://bitly.ws/KaTh>, Visited on May 11, 2023 at 20:45 p.m.



environmental perspective, without imposing restrictions on international trade or requiring labeling to distinguish genetically modified products from traditional ones.¹⁶

Negotiations continued until 2000, when consensus was reached on the final text of the protocol, which was signed at the Conference of the Parties to the Convention on Biological Diversity held in May 2000. Algeria ratified it by virtue of Presidential Decree No. 04-170 dated June 8, 2004.¹⁷

The protocol aims to protect biological safety from the effects of the transfer, handling, and use of genetically modified organisms to preserve and sustain the use of biodiversity, human health, achieve sustainable and safe benefits from biotechnology, and focus on the issue of transboundary movement of these organisms.¹⁸ This excludes pharmaceutical substances derived from genetically modified organisms, addressed by other relevant international agreements or organizations.¹⁹ The same applies to products intended for isolated use from the environment for scientific research purposes.²⁰

The protocol establishes mechanisms and procedures for assessing the environmental and health risks of genetically modified organisms before their introduction into the environment, as well as monitoring, control, reporting, and preventive measures.²¹ It emphasizes the need for prior informed consent of the importing country,²² risk assessment before introducing genetically modified organisms into the environment,²³ and information exchange with other concerned countries.²⁴ The protocol also stipulates liability and compensation for the unauthorized transfer of genetically modified organisms.²⁵

The use of genetic engineering to produce genetically modified organisms raises some concerns about the environment, including the potential and unknown impact of new innovative varieties on the biodiversity achieved by traditional varieties of living organisms since their existence.

These concerns are compounded by other issues related to the adverse effects of excessive use of chemicals in agriculture, for example. What exacerbates these concerns are the provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of 2005 in its amended version of 2017, which specify the conditions required in national laws related to intellectual property. This agreement imposes special proprietary rights on biodiversity, while the United Nations Convention on Biological Diversity recognizes collective rights of local communities. This makes original strains of various living organisms vulnerable to biopiracy through the misuse of biotechnology, thereby potentially producing genetically modified organisms and establishing

¹⁶ - SeyedEidNayel, Controls for the Trading of Genetically Modified Foods in Egypt in Light of the Biosafety Protocol of 2000, Proceedings of the Conference on Biosafety between Sharia and Law, College of Sharia and Law at the United Arab Emirates University, Al Ain, from 05 to 07 May 2002, p. 149.

¹⁷ - SeyedEidNayel, *Ibid.*, p. 150.

¹⁸ - Article 1 of the Cartagena Protocol on Biosafety, *Ibid.*

¹⁹ - Article 5, *Ibid.*

²⁰ - 2nd Paragraph of Article 6, *Ibid.*

²¹ - Articles 8, 9, 10 and 16, *Ibid.*

²² - Article 07, *Ibid.*

²³ - Articles 11 and 15, *Ibid.*

²⁴ - Article 20, *Ibid.*

²⁵ - Article 27, *Ibid.*



private ownership for certain internal or external entities, gradually replacing the original inherited strains across generations.²⁶

This problem will not find its way to resolution except through internationally binding recognition of prioritizing the application of the provisions of the Convention on Biological Diversity over the provisions of the TRIPS agreement in case of conflict between the provisions of the two agreements regarding genetic resources and traditional knowledge systems related to the use of biodiversity. It also requires a review of the TRIPS agreement and its amendment to exclude all forms of life from the systems of protection related to intellectual property rights.²⁷

Real-life examples of biopiracy incidents include the case of Turmeric (*Curcuma longa*). It belongs to the ginger family, from which saffron materials are extracted for use as a spice in Indian cuisine, with pharmaceutical and cosmetic properties used in wound healing and skin rash treatment. In 1995, two Indian citizens obtained a patent numbered 5041540 from the Mississippi-based Meissner's Corporation for the use of this plant in wound healing. Afterwards, the Indian Council for Scientific and Industrial Research requested the US Patent and Trademark Office to review the granting of that patent, arguing that the patented plant has been known for thousands of years for wound healing use, supported by documented evidence of traditional knowledge for this use, including a written text in ancient Sanskrit language, and an article published in 1953 in the Indian Medical Association Journal. Despite objections from the patent holders, the strength of the evidence presented led the US Patent and Trademark Office to support the Indian Council's claims and invalidate the granted patent.

Another more dangerous example of genetic piracy is what Monsanto, a multinational company in the field of agricultural crops, achieved through its activities in biotechnology, by obtaining a court ruling obligating a Canadian farmer to pay financial compensation of \$15,450 for replanting Canola seeds purchased from the company in 1997 under a sales contract containing a clause prohibiting the replanting of crop seeds unless the seed price is paid again, as the company claimed ownership of the intellectual property rights to the genetically modified plant variety subject to the sales contract, accusing him of violating its intellectual property rights to the genetically modified plant.²⁸

The two examples above demonstrate the danger of using scientific research in the field of genetic engineering to obtain patents for new biological varieties by transferring and modifying genetic traits, gradually replacing the original strains that are considered communal property inherited across generations by indigenous communities. Furthermore, it exploits the traditional knowledge of these communities regarding the use of these varieties in the production of traditional foods and medicines, for the purpose of acquisition by large predatory companies protected by binding international instruments.²⁹

The damages resulting from the use of genetic engineering techniques are not limited to the communal ownership of local communities, but they also threaten biodiversity and various ecosystems, due to the difficulty of predicting the potential and unknown damages of this

²⁶ - Abdel Rahim Antar Abdel Rahman, *The Impact of the TRIPS Agreement on Biological Diversity and the Traditional Knowledge Associated with It*, Dar Al-Fikr Al-Jami'i, Alexandria, 2009 edition, p. 208.

²⁷ - 2nd Paragraph of Article 27 of the TRIPS Agreement on the Commercial Aspects of Intellectual Property Rights of 2005, as amended in 2017, the official website of the Directorate of Public Relations and International Cooperation, Jordanian Customs, link: <http://bitly.ws/KaTm>, Visited on May 10, 2023, at 08:40 p.m.

²⁸ - Hossam El-Din Abdel-Ghani Al-Saghir, *Foundations and Principles of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement)*, Dar Al-Nahda Al-Arabi for Publishing and Distribution, 1998, pp. 196-199.

²⁹ - Abd al-Rahim AntarAbd al-Rahman, *Ibid.*, p. 208.



technology scientifically. This calls for the necessity of applying a highly important legal principle, called the precautionary principle, which is enshrined in many international declarations, conventions, and national environmental legislations for most countries, including Algeria.

4. The Nagoya Protocol of 2010 on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization.

In fulfillment of the objectives of the United Nations Convention on Biological Diversity of 1992, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization was adopted in Japan on October 29, 2010, as a supplementary agreement to the Convention, and entered into force on October 12, 2014.³⁰

The Conference of the Parties to the Convention on Biological Diversity adopted the Nagoya Protocol to achieve one of the objectives of the Convention, which is to gain access to genetic resources and ensure the fair and equitable sharing of benefits arising from their utilization. It includes a set of commitments related to achieving the objectives of the Protocol, based on the basic principles of obtaining prior informed consent from the countries where the genetic resource is located before accessing it, and agreeing on the terms and conditions of accessing and using the genetic resource, with the involvement of the country of origin of the genetic resource in fair and non-arbitrary access to its genetic resources.³¹

It is worth mentioning that Algeria ratified the Nagoya Protocol before being able to provide the necessary means to monitor and protect its agricultural heritage and register it, making it vulnerable to foreign ambitions to exploit its genetic resources.

Second: Genetically Modified Organisms in Algerian Legislation

The mechanisms adopted by the Algerian legislator to regulate the importation and use of genetically modified organisms are legal tools to regulate their importation, distribution, and use, and structural tools to develop and monitor genetic resources and conduct scientific studies and research on them.

1. Legal Tools

The Algerian law adopted the precautionary principle for the first time in the field of importing and using genetically modified organisms by a decision issued by the Minister of Agriculture on December 24, 2000, which prohibits the importation, production, distribution, marketing, and use of genetically modified plant material.³² Due to the lack of equipped laboratories and monitoring centers capable of examining and monitoring imported resources from abroad, the implementation of this decision remained impractical and limited to plant materials without animal ones.

The Algerian government deposited a draft law related to genetically modified organisms with the People's National Assembly for discussion, enrichment, and approval in 2003. However, this draft was withdrawn in 2004 for reasons described as legal, and it was not reintroduced for discussion again.³³

³⁰ - World Intellectual Property Organization (WIPO) website, link: <http://bitly.ws/KaTq>, Visited on May 10, 2023, at 14:00 p.m.

³¹ - Executive Secretariat of the Convention on Biological Diversity, Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, Montreal, Canada, 2011, p. 2.

³² - Article 1 and 11 of the Ministerial Decision of December 24, 2000 prohibiting the import, production, distribution, marketing and use of genetically modified plant material, Official Gazette of the Algerian Republic, N° 2, issued on January 7, 2001.

³³ - GhaniaAthamna, Regulating international trade exchanges for genetically modified organisms, doctoral thesis in public law, Faculty of Law, University of Algiers 1, academic year 2012/2013, pp. 296-297.



After ten years of withdrawing the aforementioned draft law, Law No. 14-07 dated August 9, 2014, related to biological resources was issued.³⁴ However, its implementation remained frozen due to the absence of regulatory decrees defining how to apply it.³⁵

2. Structural Tools

In accordance with the provisions of the Convention on Biological Diversity of 1992 and its supplementary protocols, Algeria has developed a national strategy for conserving and sustainably using biodiversity, mainly relying on establishing a legislative and institutional framework. As part of this strategy, Algeria has established several structures, including:

a. The Research Center for Biotechnology (CRBT) under the Ministry of Higher Education and Scientific Research, located in the Constantine Province, which is responsible for implementing scientific research and technological development programs in the field of biotechnology, with the aim of enhancing human and animal health protection, food safety, as well as monitoring and protecting the environment. The center started its activities in May 2010.³⁶

The main goal of this entity is to perform green BIOTECH manipulation, that means it only concerns researches on plants and monitoring their growth rates and nutritional values for human and animal consumption. Other forms of genetic manipulation are prohibited on the Algerian soil. Even at the level of BIOTECH Institutes, their main goal is to preserve the local species and not the development of new GMO's by any means, that is evident in the goals of the Algerian National Seed Bank which aims at the assurance of food security and the preservation of local Algerian species.

b. The National Center for the Development of Biological Resources (CNDRB) under the Ministry of Environment and Renewable Energies, which is responsible for the following tasks:³⁷

- Concentrating all inventory operations related to plant and animal species, habitats, and ecosystems.
- Providing proposals, in consultation with relevant sectors, to conserve national biological resources in accordance with the procedures specified in the applicable legislation.
- Contributing, in consultation with relevant sectors, to developing plans to valorize biological resources within the framework of sustainable development.
- Enhancing public awareness programs on the conservation and sustainable use of biodiversity.

c. The National Seed Bank in 2022, with the aim of preserving agricultural genetic heritage and promoting local seed production to ensure and enhance food security and national sovereignty, is tasked with preserving, promoting, and protecting agricultural genetic heritage from biological piracy and contributing to mitigating the consequences of the uniformity of agricultural production patterns imposed by economic globalization on agricultural systems worldwide.³⁸

After these mentioned structures started their activities, it became necessary to strengthen their role in conserving genetic resources by: generalizing the establishment of research centers in this

³⁴ - Law N° 14-07 of August 9, 2014 relating to biological resources, Official Gazette of the Republic of Algeria, No. 48, issued on August 10, 2014.

³⁵ - Hamaidi Aisha, Conservation of biological resources within the framework of sustainable development: A study in light of Algerian Law 14-07 relating to biological resources, Journal of Real Estate Law and Environment, Volume 10, Issue 01, issued on January 21, 2022, pp. 388-389.

³⁶ - National Center for Research in Biotechnology website, link: <http://bitly.ws/KaTA>, Visited on May 10, 2023 at 10:20 p.m.

³⁷ - CNDRB: National Center for the Development of Biological Resources, Laboratory Gazette, N° 41, April 2010, P. 7, Gazette Labo Site, Link: <http://bitly.ws/KaTI>, Consulted on May 10, 2023 at 11:30 a.m.

³⁸ - Seed Bank "A Guarantee of Sustainable National Food Security", article published on the Algerian News Agency website on August 15, 2022, link: <http://bitly.ws/KaTQ>, Visited on May 10, 2023, at 02:35 p.m.



vital biological field across the national territory to enhance the valorization of gene types and improve their productivity, enhance their immunity against diseases, and their ability to adapt to harsh climatic conditions, and generalizing the establishment of laboratories for monitoring and examining imported materials and living organisms.


CONCLUSION

It is evident from the foregoing that despite the existence of international and national legislation to protect against biological risks, the natural environment and human health remain exposed to serious risks that may be irreparable, foremost among them genetically modified organisms, especially in light of provisions of agreements related to trade freedom and intellectual property rights, which prevail in their application over provisions related to the protection of biodiversity and biological safety. At the national level, ministerial decisions aiming to apply the precautionary principle to specific sectoral issues are not sufficient to provide the required protection against the risks of genetically modified organisms unless legislative and regulatory texts exclusively related to this field are enacted. Therefore, the following suggestions can be made:

1. The international recognition of prioritizing the implementation of the provisions of the United Nations Convention on Biological Diversity of 1992 and its two supplementary protocols (the Cartagena Protocol on Biosafety of 2000, and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization of 2010) over the provisions of the TRIPS Agreement on Trade-Related Aspects of Intellectual Property Rights of 2005, in case of conflict regarding genetic resources.
2. The necessity to amend the TRIPS Agreement of 2005 to exempt all plant and animal organisms and related knowledge from the provisions related to the system of protection of intellectual property rights, in order to protect them from biopiracy.
3. The urgent need to enact Algerian legislation concerning the protection against the importation, marketing, and use of genetically modified materials, and to establish laboratories near international airports, ports, and border crossings to control and monitor imported materials and organisms, in order to protect the environment and public health from genetically modified organisms.

REFERENCES:

- 1- Abdel Rahim Antar Abdel Rahman, *The Impact of the TRIPS Agreement on Biological Diversity and the Traditional Knowledge Associated with It*, Dar Al-Fikr Al-Jami'i, Alexandria, 2009 edition.
- 2- Boumediene Muhammad and Bekhni Ahmed, *Precaution against genetically modified materials within the framework of consumer protection*, *Al-Ustad Al-Bahith Journal for Legal and Political Studies*, Vol. 2, N° 2, issued on 06-01-2017.
- 3- Ghania Athamna, *Regulating international trade exchanges for genetically modified organisms*, doctoral thesis in public law, Faculty of Law, University of Algiers 1, academic year 2012/2013.
- 4- Hamaidi Aisha, *Conservation of biological resources within the framework of sustainable development: A study in light of Algerian Law 14-07 relating to biological resources*, *Journal of Real Estate Law and Environment*, Volume 10, Issue 01, issued on January 21, 2022.
- 5- Hossam El-Din Abdel-Ghani Al-Saghir, *Foundations and Principles of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement)*, Dar Al-Nahda Al-Arabi for Publishing and Distribution, 1998.
- 6- Mahmoud Abdel Rahim Mahran, *Provisions of Genetic Techniques Aiming at Modifying Genetic Characteristics in Humans*, Conference on Genetic Engineering between Sharia and Law, May 5-7, 2002, College of Sharia and Law, United Arab Emirates University.

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- 7- Ministerial Decision of December 24, 2000 prohibiting the import, production, distribution, marketing and use of genetically modified plant material, Official Gazette of the Algerian Republic, N° 2, issued on January 7, 2001.
- 8- SeyedEidNayel, Controls for the Trading of Genetically Modified Foods in Egypt in Light of the Biosafety Protocol of 2000, Proceedings of the Conference on Biosafety between Sharia and Law, College of Sharia and Law at the United Arab Emirates University, Al Ain, from 05 to 07 May 2002.
- 9- United Nations Convention on Biological Diversity, signed in Rio de Janeiro, on June 5, 1992, ratified by Algeria pursuant to Presidential Decree n°. 95-163 of June 6, 1995, Official Gazette of the Republic of Algeria, N° 32, issued on June 14, 1995.
- 10- Cartagena Protocol on Biosafety to the Convention on Biological Diversity, adopted in Montreal on January 29, 2000, ratified by Algeria pursuant to Presidential Decree n° 04-170, dated June 8, 2004, Official Gazette of the Republic of Algeria, N° 38, issued on June 13, 2004.
- 11- TRIPS Agreement on the Commercial Aspects of Intellectual Property Rights of 2005, as amended in 2017.
- 12- Law N° 14-07 of August 9, 2014 relating to biological resources, Official Gazette of the Republic of Algeria, No. 48, issued on August 10, 2014.
- 13- CNDBR: National Center for the Development of Biological Resources, Laboratory Gazette, N° 41, April 2010, P. 7, Gazette Labo Site, Link: <http://bitly.ws/KaTI>, Consulted on May 10, 2023 at 11:30 a.m.
- 14- Executive Secretariat of the Convention on Biological Diversity, Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, Montreal, Canada, 2011.
- 15- Mawdoo3 website, link: <http://bitly.ws/FDcK>, Visited on May 26, 2023, at 18:20.
- 16- National Center for Research in Biotechnology website, link: <http://bitly.ws/KaTA>, Visited on May 10, 2023 at 10:20 p.m.
- 17- Official Website of the Food and Agriculture Organization (FAO), Link: <http://bitly.ws/KaTd>, Visited on May 09, 2023 at 5:45 p.m.
- 18- Official Website of the Organization for Economic Co-operation and Development OECD, Statistical definition of biotechnology (updated in 2005), Link: <http://bitly.ws/KaSW>, Visited on May 11, 2023, at 7 p.m.: 30 mins.
- 19- Ontime news website, link: <http://bitly.ws/FCKI>, Visited on May 02, 2023, time: 13:00.
- 20- Seed Bank “A Guarantee of Sustainable National Food Security”, article published on the Algerian News Agency website on August 15, 2022, link: <http://bitly.ws/KaTQ>, Visited on May 10, 2023, at 02:35 p.m.
- 21- United Nations Audiovisual Library of International Law website, Link: <http://bitly.ws/KaTh>, Visited on May 11, 2023 at 20:45 p.m.
- 22- World Intellectual Property Organization (WIPO) website, link: <http://bitly.ws/KaTq>, Visited on May 10, 2023, at 14:00 p.m.