BIOTECHNOLOGY INNOVATIONS: LEGAL PROTECTION AND THEIR IMPACT ON DEVELOPING COUNTRIES

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Abstract:

Biotechnology has evolved to serve multiple purposes, including genetic improvement of plants and animals to enhance productivity, conservation of genetic resources for food and agriculture, and vaccine development. Major powers promote biotechnology as a solution to hunger, poverty, and climate change through its application in agriculture. Despite imbalances in biodiversity: land and water. But to what extent is this true, or is the goal to enrich capitalists and protect the interests of the major powers investing in this sensitive sector? Experience has shown that biotechnology has not yet adequately benefited small farmers, nor consumers and poor countries.

***Keywords**: Biotechnology; New Plant Varieties, Food; Security; Intellectual Property.*

ملخص:

تطورت التكنولوجيا الحيوية لتستخدم لأغراض كثيرة متنوعة، كالتحسين الوراثي للنباتات والحيوانات من أجل زيادة إنتاجها وكفاءتها، والحفاظ على الموارد الوراثية للأغذية والزراعة...الخ. وروجت الدول الكبرى المتحكمة في المجال الى ان الهدف من تطبيق التكنولوجيات الحيوية بصورة متصاعدة في مجال المحاصيل، الثروة الحيوانية، الغابات وغيرها هو الحدّ من آثار الجوع والفقر عبر العالم. فإلى أي مدى كان ذلك صحيحا أم ان الهدف اثراء أصحاب رؤوس الأموال وحماية مصالح الدول الكبرى المستثمرة في هذا المجال الحساس؟ لاسيما وأن التجربة أثبتت أن التكنولوجيات الحيوية لم تنفع الى حد الآن بالصورة الكافية أياً من المزارعين أو المنتجين ذوي الحيازات الصغيرة ولا المستهلكين والدول الفقيرة.

الكلمات المفتاحية: *التكنولوجيا الحيوية؛ البيوتكنولوجيا؛ الأصناف النباتية الجديدة؛ الأمن الغذائي؛ الملكية الفكرية.*

Introduction:

The discovery by Watson and Crick of the molecular structure of deoxyribonucleic acid (DNA) in 1552 marked a monumental scientific turning point, heralding a new era in biology. Research in the field of biotechnology experienced a qualitative leap, and the late 1990s saw the emergence of global companies specializing in biotechnology and cellular engineering, such as Transgen, Genentech, and Amgen. These companies play a significant role in the health, pharmaceutical, and food industries. One example is the modification of rice DNA, which led to the development of a new flood-resistant variety now used by three million farmers in India.

There has been much recent discussion about biotechnology as an element of intellectual property and the extent to which these products are eligible for patent protection. This has sparked considerable debate among experts regarding the implications, prompting us to examine the effects of granting these types of products legal protection under intellectual property rights, and consequently, their exclusive use, particularly concerning the impact on consumer countries rather than producers of intellectual property, such as Algeria.

The central question is: Isn't the legal protection of products and innovations in the pharmaceutical and biotechnology industries under intellectual property rights a mechanism used by powerful nations to control and dominate highly sensitive areas such as health and food? What are the effects of this on humanity, especially on developing countries? And are there solutions that these countries can utilize to maintain their food and health security? We will first try to define this type of product, in addition to highlighting the advantages and disadvantages of biotechnology in the first part of this article, to address the effects of the approval of these products on developing countries and the solutions that the latter can exploit to maintain their food and health security, and to achieve sustainable development that meets the needs of humanity at present without sacrificing and harming the requirements of living organisms in the future or eliminating them completely, relying on the appropriate descriptive analytical approach to provide definitions and analyze the legal texts regulating the field, such as the International Convention for the Protection of New Varieties of Plants and the TRIPS Agreement.

The Concept of Biotechnology

In the first part of this research paper, we will begin by defining biotechnology and then attempt to shed light on its advantages and disadvantages.

Defining Biotechnology

Among the common terms for biotechnology are biotechnology, biotechnology, and the technology of living organisms. Biotechnology is considered something much larger and broader than genetically modified organisms. It encompasses a wide range of both traditional and highly modern technologies. This encompasses a wide range of technologies applied in the fields of crops and livestock, forestry and aquaculture, agribusiness, etc.

The Organization for Economic Co-operation and Development (OECD) defines it as:

"The application and use of science and technology to living organisms, both plant and animal, in order to achieve results related to their modification and development." Its use is not a modern phenomenon, but rather dates back to ancient times. What we have achieved today is merely the discovery of the scientific basis of this ancient technology. The process of transforming white flour into bread through fermentation, and milk into cheese by exposing it to bacteria, are both products of biotechnology (Dali Chaouch).

We are all aware of the impact of controlling "plant genetic engineering" and the accompanying allocation of huge investments to create new plant varieties characterized by unique properties such as high yield, drought tolerance, pest resistance, and other unique characteristics. It is a technology centered on intervening in the biological structure of plants using genetic engineering methods. This is a step that allows for the adaptation of living organisms to human needs. Biotechnology is the use of modern technological applications in manipulating living organisms. That is, dealing with with living organisms at the cellular and subcellular levels, the aim is to maximize their industrial, agricultural, and consequently economic benefits by improving their properties and genetic traits. This is achieved by studying the genetic makeup of an organism and then transferring genes from one organism to another to modify a trait or improve a defect.

Advantages And Disadvantages of Biotechnology

Biotechnology has undeniable advantages, but also disadvantages that should not be ignored. Perhaps the most prominent advantages of utilizing biotechnology are the following:

- Improving the productivity of agricultural production, both quantitatively and qualitatively
- Producing high-quality goods
- Increasing the production of basic commodities
- Replacing chemical pesticides with natural and healthy methods
- Increasing the resistance of plants and trees to diseases, drought, and harsh climates. It is used for many diverse purposes, such as genetic improvement of plants and animals to increase their production and efficiency, preserving genetic resources for food and agriculture, diagnosing plant and animal diseases, and developing vaccines, etc. For example, DNA modifications were used to develop a flood-resistant rice variety that has been used by three million farmers in India (Al-Khuwaildi, 2023). The most significant drawbacks of biotechnology are manifested, particularly in cases of misuse, through:
- The creation of new diseases affecting both animals and plants, and the development of deadly chemical weapons.
- Disruption of biodiversity.
- The manipulation of cellular genes through the control of physiological processes.

However, the most serious development is the legal recognition of intellectual property rights for biotechnology products, from which they were excluded for years. This makes it possible to grant patents for such products, which will undoubtedly have repercussions, especially for developing countries like Algeria (Makhloufi, 2005). This will be explored in the second section of this research paper.

The Interplay of Biotechnology and Intellectual Property

Recent years have witnessed a race among nations to control the vital element of "food security" by acquiring essential plant varieties such as wheat, corn, rice, and potatoes, in addition to certain plant varieties used in pharmaceutical manufacturing.

Major powers have actively sought to provide national and international legal protection for new plant varieties. They have considered "new plant varieties" to be among the emerging elements of intellectual property. Innovation in the field of plant varieties also constitutes intellectual creation, thereby granting

its creator intellectual property rights to that variety, which must be protected. This comes after biotechnology products were excluded from legal protection for years. What are the implications of this for consumer countries, small-scale producers, and developing countries? Are there solutions to address the phenomenon of exclusive legal protection for biotechnology products, especially in sensitive sectors such as raw materials and pharmaceuticals?

The Patentability of Biotechnological Products

In 1980, the first patent was granted in the United States for a genetically modified bacterium. This microorganism was capable of producing enzymes that could break down petroleum products. Despite the ongoing debate surrounding the granting of plant variety protection—arguments that this would lead to monopolies by major powers and encroach upon the food and medicine of the less fortunate—major countries and corporations succeeded in enshrining their protection. The International Convention for the Protection of New Varieties of Plants (OPV) was concluded in 1961 (last amended in 1991), and an international union called the OPV was established under this convention[1].

International legislation also yielded to this trend through the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), which obligated member states of the World Trade Organization to protect new plant varieties on the basis of industrial property. Thus, countries gradually began to recognize them as intellectual property creations and consequently their eligibility for legal protection on this basis, which meant that rights holders had exclusive rights to these products. In its ongoing efforts to join the World Trade Organization, Algeria issued Law No. 05-03 concerning the protection of new plant varieties (Law No. 05-03 , 2005). It is noteworthy that the Algerian legislator sought to grant legal protection to plant varieties, but outside the realm of intellectual property, through a separate law. This is particularly significant given that Article 8(19) of Ordinance 03-07 concerning patents explicitly stipulated that plant species, animal genera, and purely biological methods could not be patented (Ordinance No. 03-07, 2003). This position was based on the exceptions granted by the TRIPS Agreement for the protection of new plant varieties under patents, a special system, or both. Naturally, this was not without consequences; quite the contrary (Boukhemja, 2019, p. 4).

The Effects of This Legal Protection on Developing Countries

It has become clear today that the protection of new plant varieties has become a source of threat to the food and health security of Third World countries by tightening control over the food and medicine of the vulnerable, especially with regard to basic commodities such as wheat and corn, and medicines.

This is especially true due to the development by advanced countries in protecting inventions related to genetic engineering, which raises concerns that innovative varieties will gradually replace original varieties, potentially leading to serious consequences for biodiversity and the environment. In addition to the problem of developed countries registering the plant resources of poor countries in their own names and depositing them in their genetic banks, they are illegally collecting vast quantities of grains, vegetables, and fruits of significant nutritional value, as well as medicinal and aromatic herbs, which have not been exploited in developing countries nor patented. Examples include the Brazilian yucca tree, which produces natural fertilizer, or the tropical amaranth grain, rich in vitamins and requiring only a small amount of water to grow, and the Jamaican sea sponge, which has anti-cancer properties, etc. After developed countries plundered the genetic resources belonging to Third World countries and registered them, it has become extremely difficult for these countries to recover their plant resources after the TRIPS Agreement came into effect. This agreement prohibits the illegal transfer of genetic resources between countries, considering them protected intellectual property rights (Boukhemja, 2019, p. 92).

The effects of the TRIPS Agreement on developing countries are indeed significant and very serious. While some may not deny some of its positive effects, generally represented by the opportunity to access new markets, everyone agrees that its negative effects are far greater, especially... Regarding the threat to the sovereignty of these countries and the prioritization of the interests of major powers at their expense (Makhloufi, 2005, p. 127).

However, some believe that developing countries can remedy this by playing a positive role within the World Trade Organization, expressing their views during meetings at the Council level.

Intellectual property rights, and defending their ideas and interests with greater determination and conviction, in addition to benefiting to the fullest extent possible from the advantages granted by the agreement, whether related to facilitations, the right to benefit from financial and technical assistance, or the activation of the compulsory licensing system (Article 99 of the TRIPS Agreement).

The same applies to pharmaceuticals and all innovations in the health and treatment sectors, much like food products. These remained under weak or often nonexistent legal protection, as they were considered fundamental innovations

that should be made available to the widest possible audience Because they are related to the public good, patents remained prohibited for the molecules of substances, and consequently for pharmaceuticals, until the second half of the last century[2]. At that time, some developed countries began granting patents for pharmaceuticals. This was due to the development of the pharmaceutical industry worldwide and its emergence as a very powerful lobby after World War II, which began to pressure governments and dictate its terms, given its enormous financial returns[3].

It is noteworthy that pharmaceutical companies are concentrated primarily in North America (the United States and Canada), accounting for 41% of global pharmaceutical production, followed by Europe at 21%, and Japan at 15%. In other words, approximately 10% of the world's population controls the production of more than 91% of the world's pharmaceuticals (Schils, 2016, p. 8).

Article 27 of the TRIPS Agreement stipulates the possibility of obtaining a patent for the final product in addition to the "manufacturing method." This effectively prevents the possibility of counterfeiting medicines through innovation and modification of the manufacturing process, as was previously the practice. This eliminates the opportunity for developing countries to obtain medicines at affordable prices.

Patents are considered a general basis for protecting medicines, regardless of their type. Original medicines are protected by patents [4], while generic medicines are protected by trademarks (Najem, 2011, p. 119). The conditions for granting patents for medicines vary from country to country and from one international agreement to another.

The recommendations of the 51st World Health Assembly highlighted that two-thirds of the world's population lack access to essential medicines. Since the implementation of the TRIPS Agreement, it has had a negative and serious impact on global health. Ten percent of the world's population controls 91% of global pharmaceutical production, while 91% of the world's population has little or no access to medicines. The World Health Organization also stated that a very large number of people in developing countries cannot regularly acquire original essential medicines because their prices are very high and they are protected by industrial property rights, in addition to the inability to produce them locally due to a lack of technology and technical expertise (Najem, 2011, p. 101).

The issue of the relationship between patents and pharmaceuticals was first raised forcefully at the TRIPS Council in June 1998 at the request of a group of African countries and with the support of several developing nations, following the escalation of intractable diseases and deadly epidemics. Reports from the 1990s describe the pharmaceutical industry in Arab countries as the fastest-growing sector within the Arab industrial structure, in terms of providing essential

medicines at affordable prices for Arab citizens and covering a small portion of domestic demand. This was thanks to factories spread across Saudi Arabia, Algeria, Iraq, Jordan, Syria, and Egypt. The availability of raw materials necessary for such an industry, particularly in Sudan, further contributed to its growth and prosperity. The pharmaceutical industry in Arab countries was established on principles that differ from those stipulated in the TRIPS Agreement regarding patents and licenses. Protection was granted to processes but not to the final product, and drug patents were limited to a protection period of no more than seven years in most cases, compared to twenty years in developed countries (Tahrat & Belkacem, 2011, p. 11).

Arab countries' legislation used to narrow the scope of the definition of invention to facilitate the possibilities of imitation and grant compulsory licenses for the production of generic drugs. However, starting from January 1, 2006, Arab countries became obligated to begin the actual application of patent laws in accordance with the conditions of the TRIPS Agreement, which threatens to reduce the local manufacturing capacity for medicines and limit practices that are incompatible with their obligations towards international law. This means falling into the clutches of large monopolies, especially since the excessive registration of medicines has become more of an obstacle than an incentive for innovation, as even a slight change in the medicine, even in its external form, at the end of the protection period, gives the possibility of obtaining a new patent, which reduces the chances of others to obtain their own drug patents or exploit previous patents.

The flaws of the TRIPS Agreement became apparent with the worsening AIDS epidemic in the poorest developing countries, particularly in Africa. The crisis took on several dimensions: those infected in these countries were unable to access expensive, patent-protected treatments, and governments were also unable to provide these treatments to their citizens due to high costs and a lack of local production capabilities stemming from a lack of technology and expertise. Furthermore, importing inexpensive generic drugs produced in other developing countries was impossible due to TRIPS restrictions. This clearly refutes the claims of the TRIPS Agreement's drafters regarding promoting technology transfer and protecting public health.

These shortcomings, which emerged during the application of patent laws in the pharmaceutical sector, were perhaps the most significant reasons why affected countries rallied at the Doha Conference in November 2001, demanding greater flexibility towards developing nations[5].

The member states of the World Trade Organization (WTO) yielded to pressure from countries affected by the TRIPS Agreement. The WTO General Assembly adopted the Doha Declaration, issuing a resolution allowing member states to export significant quantities of generic medicines manufactured under

compulsory license to countries unable to manufacture them, with the stipulation that these medicines be used to address health crises and not re-exported.

In reality, the August resolution is an implementation mechanism for Article 9 of the Doha Declaration, detailing the procedures for parallel imports of medicines. However, it has also been criticized for being theoretical and offering impractical solutions for developing countries. Furthermore, while it mitigates the impact of the TRIPS Agreement on developing countries, it does so under very stringent conditions (Hamal & Cheikha, 2010, p. 5).

Furthermore, the flexibility inherent in the TRIPS Agreement, intended to mitigate its impact on developing countries, has largely gone unused by most of these nations. They haven't even incorporated it into their national laws, due to various reasons, such as a lack of awareness or consideration for the interests of a country exerting pressure. This is precisely what happened in Morocco, which enacted the Moroccan Patent Law in 2001 to align with TRIPS requirements. However, this law has never benefited from these facilitations; on the contrary, it has often been even more stringent than the agreement itself (Moroccan Law 17-97).

For example, Article 1 of the Moroccan law enshrines the principle of protecting devices used to obtain medicines, a provision neither mentioned nor adopted by TRIPS. In fact, the protection of research tools through patents is one of the most significant challenges currently hindering the advancement of scientific research and has generated considerable controversy, particularly as it has exacerbated the problem of patent overlap. Moroccan law, in Article 40, also addresses the exception to the prohibition of transferring or exploiting a patent when doing so would jeopardize national security, but this does not apply to cases where public health is harmed, even though this is among the exceptions recognized by the agreement.

Moroccan law makes no mention of parallel importation, meaning it is prohibited, whether for original or generic drugs. The Moroccan authorities can be excused for not including certain flexibility in their legislation, given that it was drafted before the Doha Declaration.

Nevertheless, Morocco has missed the opportunity to benefit from the advantages offered by TRIPS, particularly regarding the conditions for granting compulsory licenses, as it deprives its citizens of access to affordable medicines for at least three years.

Therefore, we hope that Algeria will learn from its sister nation's experience and avoid the same mistakes. We also hope that our legislature will recognize the necessity of incorporating all the facilities and flexibility that the agreement offers to developing countries into our national legislation (Article 99 of the TRIPS Agreement).

Despite Morocco's participation in the negotiations that led to the establishment of the World Trade Organization from its inception, this participation was not reflected in the laws it subsequently drafted concerning patent protection to safeguard its interests. It should have benefited from the intense discussions and papers presented by experts and participating delegations. This shortcoming is evident in Morocco's failure to capitalize on the flexibility afforded by the TRIPS Agreement to WTO member states, particularly in the pharmaceutical sector. This sector is vital not only because it is crucial, but also because Morocco possesses considerable production capacity compared to most developing countries. This serious error has hindered its ability to export a significant portion of its production, despite ranking second in Africa in pharmaceutical production (Hamal & Cheikha, 2010, p. 44).

This raises the question: why did Morocco make so many concessions? Foreign pressure likely played a significant role, as evidenced by the numerous and serious concessions made in the Free Trade Agreement with the United States, particularly in highly sensitive areas such as public health and agriculture. Various studies examining bilateral agreements with the United States clearly demonstrate that Morocco made concessions far exceeding those made by other Arab states. This also raises the question of what gains Morocco might potentially reap in return for these concessions, and whether the Moroccan side conducted a prior assessment of the costs and benefits of the bilateral agreement with the United States.

Conclusion:

At the beginning of this research paper, we questioned whether the increasing application of biotechnology in agriculture and livestock is truly aimed at reducing hunger and poverty worldwide, aiding adaptation to climate change, and preserving the natural resource base despite biodiversity imbalances, as is often claimed. Or is the goal to enrich and protect the interests of companies investing in this sensitive sector, particularly those belonging to major industrialized nations?

We also questioned the validity of using intellectual property to protect products and innovations in the pharmaceutical and biotechnology industries. Is it a dangerous mechanism employed by major powers to control and dominate highly sensitive areas such as health and food globally? Are there solutions these powers utilize to maintain their food, health, and political security?

In reality, all recent studies agree and confirm that the current intellectual property system serves the interests of capitalists and large states more than anything else. Furthermore, those who reap the greatest economic returns are not the innovators themselves, but rather the institutions that monopolize the knowledge produced by innovators. These institutions employ innovators for

wages and monopolize their intellectual output. Since these institutions are profit-driven entities, their primary objective is to maximize profits, not to produce more knowledge. Given that the creative process is not guaranteed to yield results and involves some financial risks, these institutions allocate minimal resources to the creative process, prioritizing the protection and sale of their monopolized knowledge at the highest possible price. Perhaps the most compelling evidence of this is how these institutions, when facing financial difficulties, reduce spending on research and development and focus on sales and marketing. Indeed, workforce reductions in any institution typically begin with the dismissal of innovators. Considering the proportion of resources these institutions allocate to research and development and knowledge production, compared to what they spend on sales, marketing, and protecting their interests, we can clearly see the low efficiency of this system in producing knowledge. Perhaps one of the most significant consequences of relying on economic returns as an incentive for knowledge development is that the funds spent on research, development, and knowledge production are directed toward producing knowledge that meets the needs of wealthier markets, those capable of paying for the output of this knowledge. The needs of the poorest are neglected, as the knowledge they require does not yield a substantial economic return. A prime example of this is the pharmaceutical market, where resources are allocated to producing drugs for diseases with large and lucrative markets, such as diabetes or allergies, for which numerous treatments already exist. Meanwhile, only minimal resources are directed toward finding treatments for diseases prevalent in sub-Saharan Africa, such as malaria and river blindness. Furthermore, there is a preference for investing in medications for chronic diseases, whose consumption continues over time, rather than investing in research aimed at finding definitive cures.

Often, the countries and institutions that promote this system do so with full awareness of its consequences: widening the economic and knowledge gap, depleting the resources of poorer countries and peoples, and transforming them into a perpetual market for an inexhaustible commodity—the product of this knowledge. A prime example of this is what is happening in the seed production industry, where some companies have managed to increase the productivity of certain crop varieties through genetic engineering. However, using this same knowledge, seeds have been modified to produce sterile crops that cannot be replanted. Consequently, countries can no longer provide agricultural crops for their citizens except by obtaining new seeds from these producing companies. As countries increasingly rely on these seeds to feed their populations, they become entirely dependent on the seed companies, allowing these companies, and by extension, wealthier nations, to exert pressure and control over their political and economic decisions.

This suspicion is further supported by the fact that the very countries and institutions that support and promote the current intellectual property system only respect it when it aligns with their interests. A prime example is what the United States did when it faced the threat of a biological weapons attack. It resorted to purchasing the antibiotics needed to treat anthrax from someone other than the original patent holder, thus violating the intellectual property system that the United States is one of the strongest proponents of.

Below, we present a set of suggestions and recommendations as solutions that developing countries can use to address this dilemma and maintain their food and health security:

- ✓ The field of biotechnology must be subject to strict state oversight and rigorous regulations must be established.
- ✓ Continuous efforts should be made to secure exceptions to legal protections for developing countries and scientific research in this field, both in international and national legislation.
- ✓ The imperative to develop scientific research in the field of biotechnology in developing countries as well, and to give greater attention to this area (allocating funds and training specialists).
- ✓ Conducting thorough feasibility studies before enshrining intellectual property protection, to understand its long-term effects and weigh the advantages and disadvantages, especially in vital sectors such as public health.
- ✓ The necessity for the Patents Department at the National Institute of Industrial Property to collaborate with various patent offices to avoid registering well-known drugs that lack innovation.
- ✓ The necessity of activating a strategy to promote generic drugs as a competitor to original drugs, which dominate the consumer market.
- ✓ Avoiding the inclusion of intellectual property protection in bilateral agreements with developed countries, as these countries aim to achieve objectives that are difficult to attain in multilateral negotiations. The TRIPS Agreement demonstrated its interest in developing countries, but in reality, the opposite has been observed. It stipulates special treatment for developing countries. While acknowledging the needs of developing nations and taking their circumstances into account, this was merely a formality. The current intellectual property system undermines the principle of knowledge accumulation, allowing for the monopolization and withholding of knowledge from humanity in order to create economic value for it.

Through this system, knowledge has been transformed from a common good of humanity, driving progress, into a commodity sold to the highest bidder. Proponents of this new approach defend their idea by arguing that allowing and legalizing the monopolization of knowledge builds a knowledge-based economy. It enables every institution or country to produce and monopolize its knowledge,

later selling it to those who need it, thus creating a source of income for knowledge producers, which in turn encourages them to innovate and create more.

Endnotes:

[1] It is an independent international organization based in Switzerland that is dedicated to the protection of new plant varieties.

[2] The physician and biologist Jonas Salk, the discoverer of the polio vaccine, used to respond to those who asked him whether he had obtained a patent for his invention by saying that it is impossible to obtain a patent for the sun! As an indication that all of humanity has a right to such discoveries and it is unreasonable for them to be monopolized by one person.

[3] For example, Britain (1977), France (1960), Germany (1976), Japan (1976), the United States of America (1976), etc.

[4] Medicines can also be protected by industrial designs and models, either for their pharmaceutical form or their packaging. This protection can be dual, such as protecting an original medicine based on a patent and simultaneously protecting it based on industrial designs, or protecting it based on both an industrial trademark and a patent if this is done through contractual licensing agreements or partnership agreements before the patent expires.

[5] The Doha Declaration on TRIPS and Public Health recommended that the TRIPS Agreement be interpreted in a way that guarantees the right to healthcare and access to medicines for all. In this context, the Declaration included several flexible aspects, such as:

- Recognizing that each member state of the organization has the right to grant compulsory licenses and determine the conditions under which they are granted. Therefore, the criteria for determining extreme emergencies that warrant licensing vary from country to country.
- The possibility of classifying cases resulting from AIDS and malaria as other extreme emergencies, thus broadening the scope of relevant health crises and thereby opening up greater scope for granting compulsory licenses by developing countries;
- The need to find a solution for countries that cannot benefit from the facilities for granting compulsory licenses because they lack the infrastructure to establish a pharmaceutical industry. She was given a deadline of January 1, 2006.

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