

Toward a normative balancing framework for global bioethics: the pro-persona Principle and Alexy's Theory

Hacia una metodología de ponderación para la bioética global: el principio pro-persona y la Teoría de Alexy


María Victoria Fernández Molina*


Academia Interamericana de Derechos Humanos, Arteaga,
Coahuila, Mexico

José Rafael Grijalva Eternod**

Academia Interamericana de Derechos Humanos, Arteaga,
Coahuila, Mexico

<https://doi.org/10.36105/mye.2026v37n3.03>

* "B" Researcher at the Inter-American Academy of Human Rights (UAdeC), Arteaga, Coahuila, Mexico, and Research Scholar at the UNESCO Chair in Bioethics and Human Rights, Rome. victoriafmolina@gmail.com ORCID record: 

** "B" Researcher at the Inter-American Academy of Human Rights (UAdeC), Arteaga, Coahuila, Mexico, and member of the International Law Association. grijalvaeternod@gmail.com ORCID record: 

Received:
11.29.2025

Sent for review:
12.09.2025

Accepted:
01.06.2026

Published:
07.02.2026

CÓMO CITAR: Fernández Molina, M. V., Grijalva Eternod, J. R. (2026). Toward a normative balancing framework for global bioethics: the pro-persona Principle and Alexy's Theory. *Medicina y ética*, vol. 37, núm. 2. DOI: <https://doi.org/10.36105/mye.2026v37n3.03>



This work is licensed under a Creative Commons Attribution-Noncommercial 4.0 International License.

Abstract

This article proposes a methodology for conflict resolution in global bioethics based on the integration of the pro-person principle with the theory of principles and weighting developed by Robert Alexy. Drawing on a critical analysis of the transnational dilemmas that characterize contemporary bioethics, an analytical framework is constructed aimed at maximizing the protection of human dignity, global justice, and sustainability. The resulting methodology offers an objective, reasoned, replicable, and culturally sensitive tool for decision-making in complex and interdependent contexts, providing a solid pathway to strengthen ethical and legal deliberation in global bioethics.

Keywords: human dignity, global justice, human rights, proportionality.

1. Contextualization

In a world marked by the gradual erosion of human rights protections, as well as by environmental, health, technological, and social crises, global bioethics has established itself as an essential field for analyzing and responding to the challenges that threaten both human and non-human life. These problems, which transcend national, political, economic, and cultural boundaries, require interdisciplinary frameworks that integrate scientific, humanistic, legal, and sociopolitical knowledge. As recognized by UNESCO, bioethics must accompany scientific development without hindering research, while ensuring that technoscience does not advance at the expense of human dignity and the social good. (1)

Since the 1970s, authors such as Van Rensselaer Potter have argued for the need for a “bridge bioethics” capable of linking scientific knowledge with ethical and ecological reflection. At the same time, Daniel Callahan identified the emergence of bioethics as a response to a horizon of technological transformations that were profoundly altering human and social life. These early contributions

were taken up by UNESCO's Bioethics Program, whose development was aimed at building an international framework for the protection of human dignity and promoting pluralistic, interdisciplinary, and global ethical reflection.

The adoption of instruments such as the *Universal Declaration on the Human Genome and Human Rights* (1997) or the *Universal Declaration on Bioethics and Human Rights* (2005) consolidated an approach that positions human dignity as the universal foundation for regulating genetics, medicine, emerging biotechnologies, vulnerability, and equitable access to scientific benefits. UNESCO emphasizes that these declarations establish a normative framework that guides decision-making in diverse contexts, promoting an "open, participatory, and pluralistic" ethics.

However, contemporary globalization has exacerbated challenges that go beyond the traditional frameworks of biomedical bioethics. Corporate concentration in the food system, artificial intelligence in healthcare, the climate crisis, rising structural inequality, and cutting-edge biotechnologies create a landscape of new risks and vulnerabilities. These phenomena compel global bioethics to evolve into a field capable of analyzing power structures, processes of exclusion, and systemic patterns of socio-environmental harm, integrating global justice as a guiding principle.

Likewise, the critique of the epistemic biases in contemporary bioethics, formulated by authors such as Florencia Luna (5) and Irene Borgonovo(6), aligns with UNESCO's approach regarding the need to incorporate multicultural perspectives, avoid paternalism, and recognize the epistemic validity of local and traditional knowledge, especially in areas such as biodiversity, community health, and biotechnologies (1). This convergence reflects the broader call for cognitive justice and the denunciation of "epistemicide" described by Boaventura de Sousa Santos (2018), who points to the systematic marginalization of non-Western knowledge in the production of global ethical frameworks. This scenario makes it necessary to rethink global bioethics not only as a descriptive or normative field, but as a methodological discipline.

If, as Durkheim notes, scientific research must aim to produce rigorous explanations that can be translated into “rules of action” to guide social life (8), global bioethics must rely on robust and replicable methods that allow for the analysis of transnational conflicts without losing cultural sensitivity. Authors such as Onora O’Neill (9) and Ruth Macklin (10) (2019) have emphasized that the legitimacy of ethical deliberation depends on transparent, justifiable frameworks oriented towards the agency of the individuals and groups affected.

On this basis, the present research starts from the premise that global bioethics cannot be limited to an abstract reflection on general principles but rather requires a coherent system of foundations and an operational method for conflict resolution. This has been precisely the objective of the research in the two previous stages of the study, as outlined in two prior articles: the construction of guiding principles for global bioethics and the analysis of the relationship between global bioethics and international human rights law,¹ which have given rise to the present proposal and allowed for the establishment of its conceptual foundations. Along the same lines, this study moves toward the development of an integrative methodology capable of analyzing global dilemmas such as access to medicines, food justice, the regulation of biotechnologies, or the ethics of artificial intelligence using coherent, replicable, and culturally relevant criteria.

In summary, the objective of this study is to develop a solid, clear, and operational methodological framework that enables the resolution of global bioethical conflicts through objective, ethically grounded guidelines that are sensitive to the moral and cultural plurality of the contemporary world.

This path inevitably leads to a central question: what principle can provide a cross-cutting axis to guide, organize, and guarantee the

¹ MVFM. Preliminary proposal for guiding principles for global bioethics capable of addressing today’s challenges. *Medicine and Ethics*. 2023; 34(2): pp. 1–20; MVFM. An analysis of Global Bioethics from the perspective of International Human Rights Law. *Medicine and Ethics*. 2024; 35(1): pp. 5–15.

humanistic and universalist orientation of this method? The following section will address this question by examining why the pro-person principle constitutes the most appropriate hermeneutical basis for articulating a methodology for conflict resolution in global bioethics.

2. Methodology

This research adopts a qualitative, legal-analytical, and bioethical approach, structured in accordance with the methodological guidelines of the legal sciences and aimed at the theoretical construction of a methodological model applicable to transnational issues in global bioethics. As this is a purely conceptual study, the objective is not to apply the method empirically, but rather to design an analytical framework that can guide ethical and legal deliberation in complex and culturally diverse contexts.

The starting point was to define the scope of the study based on the challenges currently straining global bioethics, such as the expansion of artificial intelligence, emerging biotechnologies, the socio-environmental crisis, and structural inequalities. This delimitation provided the basis for establishing the relevance of the pro-person principle as a guiding hermeneutic axis, as it enables the integration of the universality of human rights with the cultural plurality of local contexts. In this first phase, conceptual tools from contemporary legal theory were incorporated, particularly Neil MacCormick's reflections (12) on practical rationality and argumentation, as well as Luigi Ferrajoli's garantism (legal theory) regarding the normative status of fundamental rights, which must operate as limits and guarantees against the exercise of power and new forms of technological and biological vulnerability (13).

The second phase consisted of a documentary and normative analysis based on primary and secondary sources. Primary sources included the main international human rights instruments, interpretive reports of the UN Human Rights Committee, relevant decisions

of the Inter-American Court of Human Rights and the European Court of Human Rights, as well as advisory opinions that elaborate on essential content and positive obligations of States. This body of case law made it possible to identify criteria of proportionality, reasonableness, vulnerability, dignity, and non-discrimination, which are indispensable for the construction of a bioethical method guided by international standards.

Among the secondary sources, theoretical contributions were analyzed that allow for the articulation of a well-grounded methodological framework. Of particular note is Robert Alexy's balancing model (14), whose theory of principles offers a particularly useful architecture for integrating values, rights, and contextual circumstances. Added to this foundation were contributions by Joseph Raz (15) on normative justification and practical authority, as well as Nicola Lacey's (16) analyses of critical interpretive methodologies and their relevance for understanding legal decisions in multicultural contexts. This set of sources allowed for the identification of structural categories (human dignity, justice, proportionality, vulnerability, and accountability), which serve as pillars of the proposed method.

Based on these inputs, an interdisciplinary methodological framework was designed that integrates international human rights law with bioethical reflection. The model seeks to reconcile the normative generality inherent in law with the cultural sensitivity required for ethical decision-making in diverse settings, avoiding both rigid universalisms and relativisms that hinder global deliberation. Alexy's weighing scheme was adapted as a conceptual tool to illustrate how the pro-person principle can guide justified, transparent, and consistent normative responses in the analysis of emerging global bioethical dilemmas.

Finally, the methodology was evaluated in terms of internal coherence, argumentative soundness, and theoretical replicability. In line with the need, highlighted in the previous conceptual framework, for clear and reproducible methods for ethical decision-making in transnational contexts, this study presents an open proposal that can be developed and applied to emerging dilemmas such as the

governance of artificial intelligence, gene editing, environmental justice, digital health, or the global distribution of scientific benefits. The aim is to consolidate a rigorous, transparent, and culturally sensitive methodological system for contemporary global bioethics.

3. Why the pro-persona principle?

Within the proposed methodological framework, the pro-persona principle constitutes the most appropriate hermeneutic axis for guiding ethical and legal deliberation in global bioethics. This assertion is grounded in the fact that its function is not limited to resolving normative conflicts but rather operates as a structuring criterion that orders the interpretation of rights, principles, and values in accordance with the option most favorable to human dignity. Furthermore, its expansive nature, which drives the broadening of the content and scope of rights in the face of new technologies and bioethical risks, makes it a particularly suitable tool for contexts of scientific uncertainty. This interpretive logic, extensively developed by the Inter-American Court of Human Rights (IACHR), requires that every authority choose the alternative that maximizes the protection of the person, even when multiple norms or possible interpretations exist.⁽¹⁷⁾ The UN Human Rights Committee has taken the same position, emphasizing that the rights under the Covenant must be interpreted expansively, avoiding unjustified restrictions and adopting positive measures to ensure their effective realization ⁽¹⁸⁾. In this way, the pro-person principle acts as a bridge between universal standards and emerging bioethical challenges, preserving the primacy of the person in the face of technological advances.

From a theoretical standpoint, the pro-person principle finds its basis in the structure of fundamental rights as principles rather than as closed rules. In Robert Alexy's formulation, principles are optimization mandates that must be realized to the greatest extent possible, which requires balancing procedures that articulate normative universality and concrete circumstances ⁽¹⁴⁾. Hence, the requirement

of maximization does not depend on subjective preferences, but on a normative structure that guides interpretation toward the most protective solution possible. Under this logic of principles as optimization mandates, this framework allows us to understand why the pro-person principle is not a hermeneutic privilege, but an internal mechanism within the logic of rights, since by maximizing the possible protection in each case, it reaffirms its moral claim to correctness and its binding nature for authorities, in addition to reinforcing the duty to publicly justify any restriction on rights under strict standards of proportionality.

The Latin American legal tradition has deepened this insight. Cançado Trindade, for example, considers that the pro homine principle is rooted in the centrality of human dignity and is characterized by its expansive nature, aimed at broadening protection and never at restricting it. Héctor Fix-Zamudio early on developed the idea of the *pro-homine* as a requirement for interpretation that is more favorable to the individual in the face of restrictive norms (20), while Sergio García Ramírez and the Inter-American Court of Human Rights itself consolidated its status as a cross-cutting principle of the inter-American system, linked to the review of conformity with treaties and the primacy of human dignity (21). Finally, Ferrer Mac-Gregor demonstrated that this principle articulates the constitutionality block and enables an integrative reading of rights that binds all authorities without exception (22). This evolution has made it a pillar for any methodology that aspires to integrate law, ethics, and cultural plurality.

From a legal-philosophical perspective, the validity of the pro-person principle is reinforced by contemporary theories of rights. In this regard, Ronald Dworkin defined fundamental rights as “trump cards” against majority decisions, which requires interpreting them in their strongest form in favor of the individual and understanding them as moral limits on the exercise of power, even when that power is exercised through democratic procedures. Hence, the interpretation of rights must prioritize the option that best expresses the equal value of each person (23). In parallel, Martha Nussbaum’s

capabilities approach emphasizes that human dignity entails guaranteeing real conditions for the development of core capabilities, which aligns the pro-person principle with a high standard of substantive protection (24). These perspectives allow us to understand the principle not only as an interpretive guideline, but as an ethical requirement linked to equality, agency, and global justice.

In environmental matters, the pro-person principle finds a direct anchor in the *in dubio pro-natura* principle, which mandates that, in the face of uncertainty, decisions most favorable to the protection of nature be adopted. A key reference is Amparo in Review 953/2019, in which the Supreme Court of Justice of the Nation of Mexico recognized that the right to a healthy environment has a dual dimension: on the one hand, anthropocentric, as an indispensable condition for guaranteeing the life, health, and other rights of individuals and communities; and, on the other hand, an ecocentric dimension, which recognizes the intrinsic value of nature, making it worthy of protection even beyond its utility to humans.

Consistent with this conception, the Court applied the principles of precaution and *in dubio pro-natura*, establishing that the State has an obligation to prevent environmental harm even when there is no full scientific certainty regarding the magnitude of the risk, and that, when in doubt, the alternative that favors environmental conservation must always be chosen. Likewise, it emphasized that this protection must be approached from an intergenerational perspective, addressing both the rights of present generations and those of future generations (25).²

² In Amparo en Revisión 953/2019, the Supreme Court of Justice of the Nation ruled in favor of Ejido S, composed of people who self-identify as Maya indigenous peoples, against the authorization granted by the Ministry of Energy (SENER) for a wind and photovoltaic project in Yucatán. The core of the decision rested on the fact that the authorization was granted without adequately identifying the environmental risks, particularly those related to the “Yucatán Peninsula” aquifer, nor fully guaranteeing the communities’ right to prior, free, and informed consultation. Supreme Court of Justice of the Nation (Mexico). Right to a healthy environment and rights of indigenous communities (Social assessment of an energy project in Yucatán).

In the field of global bioethics, the pro-persona principle offers a point of convergence between universality and pluralism. Its hermeneutic structure facilitates the integration of common values —such as dignity, justice, and non-discrimination— with attention to specific cultural contexts, avoiding both rigid universalism and relativisms that neutralize global deliberation. Furthermore, its emphasis on maximizing protection is consistent with a heightened focus on vulnerability, a central element in transnational issues such as genetic editing, the governance of artificial intelligence, health inequalities, and environmental risks.

In summary, the pro-person principle represents the most solid hermeneutic foundation for structuring a conflict resolution methodology in global bioethics. Its normative strength, its consistency with international human rights standards, and its capacity to integrate cultural diversity and enhanced protection make it the ideal cross-cutting criterion for sustaining a sensitive, universalist, and ethically rigorous method. Following this line of argument, the next section will demonstrate how this principle aligns with the proposed methodological framework and how it enables the guidance of complex decisions through clear, justifiable, and replicable guidelines.

4. Toward the construction of a methodology for global bioethics based on Alexy's Theory of Principles

The development of a robust methodology for global bioethics requires, first and foremost, an understanding of the normative foundations that guide both law and bioethics in their global dimension. Although both fields have developed their own principles, their structure, function, and practical orientation reveal significant points of convergence that allow them to be articulated within a single methodological framework. Therefore, this section examines, on the one hand, the general principles of law, which operate as interpretive, integrative, and limiting criteria within the legal order; and, on the other hand, the principles of global bioethics, formulated from

intercultural ethical frameworks and embodied in instruments such as the Universal Declaration on Bioethics and Human Rights (2005) and in contemporary literature. Analyzing both sets of principles is essential to demonstrate that they share an optimizing logic and a similar guiding function, which opens the possibility of adopting Robert Alexy's methodology as an operational bridge between legal reasoning and bioethical deliberation in complex global contexts.

4.1. General principles of law: nature, types, and normative structure

In contemporary legal theory, general principles have established themselves as one of the essential normative foundations for understanding and applying the law. Unlike norms—closed rules that operate in a binary manner and determine what is permitted and what is prohibited—principles possess an open, optimization-oriented structure, allowing them to adapt to complex contexts and provide answers when rules prove insufficient. As Dworkin explains, principles express “demands of justice or equity” that must be considered even in the absence of a specific rule (23). Alexy deepens this understanding by characterizing them as optimization mandates, that is, norms that must be realized to the greatest extent possible according to the legal and factual circumstances of the case (14). From a complementary perspective, Atienza (26) and Bobbio (27) emphasize that principles fulfill an axiological function that provides coherence and direction to the legal system as a whole, operating as ultimate criteria that guide interpretation and limit the exercise of power. This structure is particularly useful in bioethics, where dilemmas arising from uncertainty, vulnerability, or moral pluralism exceed the scope of rules and require principled frameworks to guide decisions in contexts of moral uncertainty.

A. Nature and function of general principles of law

As previously discussed, principles operate as norms of a high level of abstraction that express the fundamental values of the legal sys-

tem, such as human dignity, equality, justice, proportionality, or good faith. Legal doctrine has noted that these principles fulfill three essential functions within the legal system: an interpretive function, which guides the application of ambiguous norms; an integrative function, which allows for the filling of regulatory gaps when no applicable rule exists; and a function of limiting power, which acts as a check against potential arbitrariness in the exercise of public authority (28).

Robert Alexy offers the most influential characterization in contemporary legal theory by defining principles as optimization mandates—that is, norms that require something to be realized “to the greatest extent possible” within the legal and factual possibilities of the case (14). This structure radically distinguishes them from rules, which are applied in binary terms—they are either complied with or violated—while principles allow for varying degrees of satisfaction depending on the context. Alexy elaborates on this distinction in detail by explaining that, although both are norms, their methods of conflict resolution differ structurally: conflicts between rules are resolved through invalidity or exception, whereas conflicts between principles require balancing (14).

Due to their open, evaluative, and gradual nature, principles play a particularly significant role in scenarios where rights, collective goods, constitutional values, and complex ethical-social considerations converge. This dimension has been widely recognized by analytical legal theory, which emphasizes that principles allow for a reasoned approach to conflicts between values that cannot be resolved through rigid rules. (29) It is precisely this explanatory and normative flexibility that makes their use possible in global bioethics, where the complexity of dilemmas demands tools capable of integrating different interests, levels of impact, and cultural perspectives.

B. Types of principles in legal tradition

General principles of law can be classified into three broad categories, all of which are relevant for methodological articulation with global bioethics.

a) *Constitutional principles*

These are principles that derive directly from the Constitution and possess the highest normative hierarchy. Contemporary constitutional doctrine emphasizes that these principles —human dignity, equality and non-discrimination, freedom, proportionality, legal certainty, social justice, pluralism, and tolerance, among others— fulfill a structural function within the legal system by expressing the overarching values that guide the interpretation and validity of the normative system. Alexy notes that these principles operate as optimization mandates, the realization of which must be maximized within the factual and legal possibilities of the case, constituting the axiological core of modern constitutionalism (14). This conception aligns with Zagrebelsky’s theory regarding principles as elements endowed with “ductility” that allow the law to adapt to changing contexts without losing its rational integrity (30). Similarly, Ferrajoli emphasizes that dignity, equality, and social justice act as limits and foundations of state power in any constitutional democracy (13).

b) *Principles of international human rights law*

International law has reinforced the principle-based framework through interpretive criteria aimed at maximizing the protection of the individual. Among these, the pro-person principle stands out, according to which the interpretation most favorable to human rights must always be adopted. The Inter-American Court of Human Rights applies this principle systematically, as seen in the case of *Gelman v. Uruguay*, where it prioritizes the enhanced protection of human dignity (17).

The international system also incorporates positive obligations, namely: the requirement that States adopt active measures to guarantee rights, a doctrine originally formulated in *Velásquez Rodríguez* (31). Finally, the Human Rights Committee has established that any limitation on a right must pass a strict proportionality test and be

justified by public reasons, as elaborated in General Comment No. 31 (32). This interpretive framework is particularly relevant to global bioethics, where the management of techno-scientific risks requires criteria that always prioritize the broadest protection of the person.

c) *Principles of environmental law*

In the field of environmental law, principles have gained increasing relevance due to scientific uncertainty, global interdependence, and the magnitude of contemporary ecological risks. These principles (prevention, precaution, common but differentiated responsibility, and sustainability) constitute a body of norms that guides state action in the face of threats that simultaneously affect people, ecosystems, and future generations. Their legal formulation reveals a flexible and optimizing structure similar to that of constitutional and human rights principles, making them ideal tools for addressing complex dilemmas in global bioethics.

The principle of prevention requires states to adopt anticipatory measures to avoid foreseeable environmental harm. In this regard, the Basel Convention stipulates that states must minimize the generation of hazardous waste and manage it in a manner compatible with the protection of life and the environment (33). Similarly, Principle 2 of the Rio Declaration affirms that states have full sovereignty to exploit their natural resources, but are obligated to prevent their activities from causing transboundary harm or affecting areas outside their jurisdiction (34). Prevention, therefore, introduces a duty of care that is triggered even before actual harm occurs, and seeks to ensure that public decisions incorporate a prudent assessment of foreseeable risks.

When scientific uncertainty prevents the accurate prediction of potential harm, the precautionary principle comes into play, one of the pillars of global environmental governance. Principle 15 of the Rio Declaration establishes that, in the face of threats of serious or irreversible harm, “a lack of scientific certainty should not be used as a

reason for postponing effective measures” (34). This approach has been developed normatively in the Cartagena Protocol on Biosafety, whose Articles 10–11 authorize States to restrict or deny the importation of living modified organisms when there are plausible risks to biodiversity or health, even in the absence of conclusive evidence. (35) Precaution, thus, strengthens the protection of the environment and vulnerable populations against emerging technologies and global risk scenarios.

The principle of common but differentiated responsibilities is based on the idea that, although all states share the obligation to protect the environment, not all have the same capacities or the same historical responsibility regarding ecological degradation. In this vein, Principle 7 of the Rio Declaration states that States must cooperate in a global effort, recognizing “common but differentiated responsibilities” (34.) Likewise, the United Nations Framework Convention on Climate Change (UNFCCC) reaffirms this criterion in Article 3.1, stating that developed countries must take the lead in mitigation actions due to their historical contribution to climate change. Based on these elements, this principle introduces an approach to global environmental justice that is indispensable for global bioethics, which also confronts structural inequalities and power asymmetries between regions.

Finally, the principle of sustainability constitutes the ethical and political foundation of contemporary environmental law. In this regard, the Brundtland Report defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (37). This perspective was subsequently incorporated into the Rio Declaration through Principles 1, 3, and 4, which place people at the center of environmental concerns, require the protection of future generations, and incorporate sustainability as an essential part of the development process (34). In the context of a planetary crisis, this principle not only links environmental protection with intergenerational equity but also provides an indispensable regulatory frame-

work for addressing global dilemmas such as climate change, biodiversity loss, or the management of high-impact technologies.

Together, these environmental principles function as optimization mandates aimed at maximizing the protection of human life, public health, and ecosystems. Their evaluative, flexible, and interpretive nature makes them fully compatible with the structure of constitutional principles, human rights, and the principles of global bioethics. In this way, environmental law not only enriches legal analysis but also provides fundamental criteria for resolving transnational ethical dilemmas in an increasingly interdependent and vulnerable world.

In summary, the possibility of articulating the general principles of law with those of global bioethics rests on their shared optimizing structure, which configures them as open, adjustable norms oriented toward maximizing protection. In both the legal and bioethical spheres, principles require weighing, contextualization, and rational justification, which allows for the integration of cultural, social, and environmental factors without resorting to mechanical or absolutist decisions. This structural convergence reveals that Alexy's methodology is not only transferable but particularly well-suited to addressing contemporary global dilemmas, where challenges related to human life, health, technology, the environment, and justice converge.

5. Principles in global bioethics: dignity, justice, and sustainability

The fundamental principles of global bioethics are not merely a catalog of values, but rather an open, dynamic, and optimizing ethical framework that guides decision-making in contexts characterized by cultural diversity, structural inequality, and transnational risks. In *Global Bioethics. An Introduction*, Ten Have argues that these principles should serve as guides for global action, capable of integrating ethical, social, environmental, and political considerations (38). The most relevant ones are discussed below.

- a) **Human dignity.** Dignity constitutes the central principle of global bioethics. For Ten Have, dignity is not merely an individual attribute, but a “universal moral criterion” necessary for any ethical framework in pluralistic societies (38). In the UNESCO Declaration on the Right to Health (Art. 3) (39), dignity appears as the foundation for protecting all people from practices that violate their integrity, autonomy, or intrinsic value. In global terms, this implies recognizing that all human beings, regardless of their culture, origin, social condition, or political status, deserve equal consideration and respect.
- b) **Vulnerability.** Vulnerability is a distinctive principle of global bioethics. Ten Have emphasizes that economic, health, and environmental inequalities increase certain groups’ exposure to disproportionate risks, meaning that vulnerability takes on a structural dimension, not merely an individual one (38). Along these same lines, the Universal Declaration on Bioethics and Human Rights (Art. 8) calls for special protection for those facing biological, social, or cultural vulnerabilities. From a global perspective, it recognizes that phenomena such as climate change, armed conflicts, or chronic poverty generate systemic vulnerabilities that require strengthened ethical responses.
- c) **Solidarity and cooperation.** Solidarity is understood as the recognition of global interdependence and shared responsibility among individuals, communities, and states. This principle demands coordinated actions to address collective risks and promote equity among regions with unequal capacities (UNESCO, Art. 13) (39). Ten Have emphasizes that solidarity is indispensable for global justice, as it enables progress toward models of transnational cooperation that transcend the logic of competition and accumulation (38).
- d) **Global justice.** Global justice, as Ten Have points out, involves ensuring equitable access to basic goods, namely: health, food, medicines, technologies, and a healthy environment,

regardless of national borders. It therefore means correcting historical and contemporary inequalities through global policies that reduce gaps between the center and the periphery. This principle is linked to what Acevedo-Merlano calls “epistemological vigilance”: preventing bioethics from reproducing colonial logics and ensuring that all cultural epistemes participate horizontally in deliberation (40).

- e) ***Protection of the future and sustainability.*** Global bioethics also incorporates an intergenerational approach. For Ten Have, sustainability involves protecting natural resources, biodiversity, and the planet’s viability for future generations (38.) The Universal Declaration on Bioethics and Human Rights (Art. 17) reinforces this idea by noting that ethical decisions must consider their long-term ecological and social impact (39). Within this framework, the principles of prevention and precaution are incorporated as fundamental ethical criteria to guide decisions regarding disruptive technologies, environmental risks, and frontier biotechnologies.
- f) ***Social responsibility and benefit-sharing.*** This principle requires that science, technology, and global policies promote the well-being of individuals and communities and is fully enshrined in the UNESCO UDHRB (Art. 14) (39). It entails ensuring equitable health systems, equitable access to essential goods, and a fair distribution of the benefits derived from research and innovation. In this vein, Ten Have emphasizes that global bioethics imposes on science a social responsibility aimed at ensuring that scientific advances effectively contribute to the common good and do not exacerbate structural inequalities, which requires robust mechanisms for *benefit sharing* and distributive justice in contexts of vulnerability. This principle has also been expanded by critical currents that highlight the need to guarantee distributive justice and the cultural relevance of benefits to avoid the imposition of hegemonic epistemologies. From this perspective, Acevedo-Merlano warns that social responsibility can only be fulfilled if the

benefits respond to the real needs of populations and respect their cultural frameworks (40).

A direct consequence of this optimizing structure is that these principles must be interpreted and applied in a flexible, adaptive manner, oriented toward maximizing human, social, and environmental protection according to the possibilities and limits of the context. This structure is identical to that of the legal principles conceived by Alexy as optimization mandates. Therefore, global bioethics and law can converge on a single method of weighing, capable of resolving conflicts between values, rights, and interests in complex global scenarios.

6. Robert Alexy's methodology applied to global bioethics

The theory developed by Robert Alexy offers a methodological framework particularly suited to addressing dilemmas involving multiple conflicting values. In *Theory of Fundamental Rights*, Alexy distinguishes between rules and principles, emphasizing that the latter are not definitive mandates but rather optimization principles that require their realization “to the greatest extent possible,” in accordance with the legal and factual possibilities of the case. While rules are either applied or invalidated, principles can conflict without this implying the elimination of one of them. This gradational structure makes principles ideal tools for analyzing problems where different levels of protection, normative expectations, and demands for justice converge—features that paradigmatically characterize bioethical dilemmas. A key aspect of this understanding is the need to resort to balancing when two principles collide. This procedure is not an intuitive or merely discretionary exercise, but a structured argumentative operation through which the relative importance of each principle is evaluated to determine which should prevail in the specific case,

without completely nullifying the other. Such reasoning constitutes the core of Alexy's methodology and lays the groundwork for its application beyond the strictly legal sphere, including fields where rights, collective goods, scientific uncertainties, and power asymmetries converge.

6.1. The structure of balancing in Robert Alexy's Theory: proportionality and interdependence of principles

Robert Alexy's theory of fundamental rights constitutes one of the most influential models for resolving normative conflicts in contemporary law. Its central contribution lies in understanding fundamental rights not as rules of binary application, but as principles, that is, optimization mandates that must be realized to the greatest extent possible according to the factual and legal possibilities of the case (14). This structure implies that, when two principles collide, neither is automatically invalidated: the task consists of determining which should prevail in the specific case through a rational balancing procedure. This allows for the resolution of complex conflicts without sacrificing either the normative force of the principles or the need for concrete decisions.

6.1.1. The principle of proportionality as a methodological framework

For Alexy, proportionality is the mechanism that allows conflicts between principles to be resolved without emptying them of their essential content. It consists of three interdependent sub-principles: suitability, necessity, and proportionality in the strict sense, which ensure that any restriction on a right is rational, justified, and respectful of its normative core (14).

- a) ***Suitability.*** The first test consists of verifying whether the measure adopted is suitable for achieving a legitimate aim. Suitability requires establishing a logical and causal relationship

between the measure and the objective: if the measure does not contribute to achieving the aim, it must be rejected without proceeding to subsequent stages. Its function is to exclude arbitrary or symbolic measures that restrict rights without producing any real benefit.

- b) *Necessity*.** The second sub-principle requires selecting, from among all possible alternatives, the one that least affects the restricted right or principle, provided it is equally effective in achieving the pursued objective. Necessity, therefore, implies a comparative examination of alternative means. For Alexy, this step prevents excessive restrictions when less burdensome options exist and responds to the optimizing nature of principles: they must be satisfied to the greatest extent possible, unless there are strictly justified reasons to limit their realization.
- c) *Proportionality in a strict sense*.** This is the decisive stage of the balancing process. It consists of assessing whether the importance of satisfying the principle protected by the measure outweighs the impact imposed on the opposing principle. Here, the Law of Balancing applies, formulated by Alexy as follows: *“The greater the degree of impact on a right, the greater must be the importance of satisfying the opposing principle that justifies it”* (14).

This analysis is not limited to verifying legitimacy or effectiveness, but seeks to determine whether there is a reasonable balance between the conflicting interests. A measure may be suitable and necessary, and yet still be disproportionate when the sacrifice it imposes clearly exceeds the benefits obtained. Therefore, proportionality in the strict sense operates as a substantive limit that prevents the justification of excessive or unjustified restrictions. In other words, it acts as a normative brake against decisions that, under the rhetoric of the public interest or scientific progress, could seriously erode the rights or dignity of the affected individuals.

6.1.2. *Internal methodological criteria for balancing*

Beyond proportionality, Alexy introduces a set of methodological principles that ensure that balancing is a rational exercise and not a discretionary decision. These criteria define the epistemological and argumentative framework that must guide any balancing process.

- a) ***Principle of justification.*** Any restriction of a principle must be justified by public, verifiable reasons that are subject to intersubjective scrutiny. Decisions cannot be based on intuitions, subjective preferences, or unsupported assessments. This is particularly relevant in global bioethics, where controversies often involve diverse communities that demand reasons comprehensible to a pluralistic audience.
- b) ***Principle of congruence.*** Decisions must be consistent with the legal system as a whole, avoiding internal contradictions among norms, precedents, and recognized principles. This criterion prevents solutions that are arbitrary or incompatible with the normative structure of the legal system.
- c) ***Principle of universalization.*** This implies that equivalent cases must be treated equivalently. Balancing cannot be based on unjustified contextual preferences, but rather on criteria that can be upheld as valid for any analogous case.
- d) ***Preservation of the essential core.*** No balancing exercise can completely nullify a right or principle. Each retains a minimum inviolable content that cannot be sacrificed in the name of instrumental objectives. This limit protects the integrity of the system of rights and the very concept of human dignity.
- e) ***Law of balancing.*** Formulated as an autonomous principle, it establishes that the justification for a measure must increase in direct proportion to the degree to which the principle it restricts is affected. This rule structures the reasoning and requires demonstrating, with strong arguments, why a significant sacrifice is justified.

- f) **Weight formula.** To operationalize the comparison between principles, Alexy introduces the “weight formula,” which assigns values based on: the abstract weight of the principle; the concrete weight in the case; and the severity and probability of the associated harms or benefits. The formula does not aim to mechanize the weighing process, but rather to organize the reasoning and increase its transparency. Thus, in areas where decisions often involve uncertain risks and irreversible effects, this tool helps to make the underlying value judgments explicit so that they can be subjected to critical scrutiny.
- g) **Epistemic principle.** The rationality of weighing depends on the quality and sufficiency of available knowledge. When evidence is uncertain, incomplete, or controversial, a heightened standard of justification must be applied and, where appropriate, more protective measures are adopted until greater clarity is obtained. This principle recognizes that weighing resolves not only normative conflicts but also factual uncertainties. This is decisive when facing dilemmas—such as the governance of artificial intelligence or long-term environmental effects—that arise precisely under conditions of scientific uncertainty.

Alexy’s theory offers a structured, transparent, and justifiable methodology for addressing conflicts between principles. Its architecture, based on proportionality, rational justification, and preservation of the essential core, allows for balanced decision-making in scenarios where highly relevant values converge. Weighing, far from being a discretionary exercise, constitutes a rigorous normative procedure that articulates principles in a coherent and reasoned manner (14). For this reason, it presents itself as a particularly fruitful tool for global bioethics, which requires methods capable of integrating axiological pluralism, enhanced protection of dignity, and attention to complex contexts. The following section will demonstrate how bio-

ethical principles can be incorporated into this weighing framework without losing their specificity.

7. The integration of global bioethical principles into Alexy's methodology for conflict resolution

As previously analyzed, global bioethics is structured around principles, namely: universal human dignity, vulnerability, global justice, solidarity, sustainability, precaution, and social responsibility. These principles do not operate as closed rules, but rather as open normative guidelines, context-dependent and subject to gradation. It is precisely this structure that allows for their integration into Alexy's methodology, as bioethical principles share the same optimizing nature, the same semantic openness, and the same need for rational justification as legal principles.

Alexy's theory offers a framework for articulating these principles in complex conflicts without sacrificing their plurality or their universal dimension. The following section systematizes how this integration is carried out (14).

7.1. Structural compatibility between bioethical principles and Alexy's Theory of principles

The first condition for applying Alexy's methodology to global bioethics is to recognize that bioethical principles possess a structure and function analogous to those Alexy attributes to legal principles: they are not rules, but open-ended norms; they guide action toward the maximum possible protection of the values they express; they may legitimately conflict without one necessarily invalidating the other; they require a process of rational justification to determine their application in each case; and they possess an essential core that cannot be completely sacrificed.

Therefore, global bioethics does not need to artificially adapt its principles to a legal framework, as they already function internally as

optimization mandates, allowing them to be directly transferred to Alexy's balancing framework. This point is crucial, because it shows that Alexy's methodology does not operate as an external graft onto global bioethics, but rather as a way of ordering, explicating, and justifying deliberative practices that are already implicit in its own normative logic.

7.2. *The principles of global bioethics as "optimization mandates"*

In Alexy's theory, a principle expresses a requirement that must be fulfilled to the greatest extent possible, given the legal and factual conditions of the case. In this sense, the principles of global bioethics fit perfectly into this logic, as can be seen:

- **Universal human dignity:** must be maximized in all decisions involving life, integrity, and autonomy.
- **Structural vulnerability:** demands increasing levels of protection according to the intensity of the risk and the social position of the affected group.
- **Global justice:** requires correcting historical and contemporary inequalities to the greatest extent possible given the context.
- **Global solidarity:** implies expanding the scope of cooperative duties as interdependence and shared risks increase.
- **Intergenerational sustainability:** requires maximizing the conservation of natural resources and the living conditions of future generations.
- **Precaution:** demands increasing protection as scientific uncertainty and the potential for serious or irreversible harm grow.
- **Social responsibility:** requires ensuring increasing levels of well-being and benefit for affected communities.

Each of these principles can be formulated as an optimization mandate in the Alexian sense: they are realized in degrees, may constrain one another, and require a weighted evaluation to determine their

relative weight in each case. Thus, global bioethics can directly draw on Alexy's conceptual framework to make explicit the criteria by which it prioritizes, limits, or reinforces these principles in concrete situations.

7.3. *Weighing as a tool for resolving tensions between bioethical principles*

When bioethical principles collide, Alexy's theory allows for the articulation of a rational process to determine which should prevail in the specific case. Weighing replaces intuitive or self-referential decisions with a structured method:

- a) ***Identification of the conflicting principles.*** Determine which bioethical values or goods are affected: dignity, collective autonomy, justice, environmental integrity, public health, etc.
- b) ***Analysis of the factual and epistemic context.*** Here, the methodology requires evaluating: actual or potential risks, degree of scientific uncertainty, structural vulnerabilities, intergenerational effects, and equitable distribution of burdens and benefits. This contextual analysis is consistent with Alexy's epistemic principle. In global bioethics, this step is essential to avoid reducing dilemmas to an abstract relationship between principles, but rather to situate them within concrete frameworks of inequality, technological asymmetry, and global risk.
- c) ***Weighing the principles.*** The final stage of the weighting analysis requires determining the priority relationship among conflicting principles by applying the weighting formula proposed by Alexy. This procedure allows for a rational and justifiable evaluation of which principle should prevail in the specific case without invalidating the other. To this end, three dimensions are considered:
 - *Abstract weight*, which refers to the general and structural importance of the principle within the normative order.

Thus, principles such as human dignity or personal integrity typically carry the greatest abstract weight, given their foundational nature and their close connection to the essential core of fundamental rights.

- *Concrete weight*, which assesses the specific intensity of the impact on the principle in the case under analysis. Not all impacts are of equal magnitude: a minor interference does not carry the same weight as a profound or irreversible restriction.
- *Probability and intensity of harms or benefits*, which involves assessing, based on available evidence, how likely the measure is to produce harmful or protective effects, as well as the severity of those effects. This dimension takes on special relevance in scenarios of scientific uncertainty, which are characteristic of global bioethics.

A joint analysis of these three variables makes it possible to determine which principle should be given relative priority in the final decision, without invalidating or eliminating the conflicting principle, but rather by adjusting the extent to which it is realized in accordance with the limits and possibilities of the case. In this way, the balancing process preserves the optimizing structure of the principles and ensures a balanced, transparent resolution that respects the essential core of each one. In practical terms, the methodology makes it easier to explain why, for example, in certain circumstances the protection of public health may take precedence over certain individual freedoms, or why global justice and intergenerational sustainability require restricting immediate economic interests

7.4. Protection of the essential core of bioethical principles

One of the most significant contributions of Alexy's theory is the requirement to preserve the essential content of each principle, even during weighing. Applied to global bioethics, this criterion implies

that no principle can be entirely sacrificed in the name of another, as each contains an irreducible normative core that must remain safeguarded. This means, for example, that human dignity cannot be completely subordinated to collective goals; that global justice cannot be displaced by considerations of mere technical or economic efficiency; that sustainability cannot be ignored in decisions whose consequences affect future generations; and that structural vulnerability cannot be rendered invisible to favor majority interests or more powerful actors.

In this sense, balancing has clear limits: it allows for justified restrictions but does not permit decisions that completely strip a fundamental bioethical principle of its content. Alexy's methodology thus ensures that the resolution of complex dilemmas preserves the ethical backbone of global bioethics, preventing principles from becoming mere negotiable variables. In this way, the articulation between Alexy and global bioethics helps to shield an inalienable ethical minimum from political or economic pressures.

7.5. Universalization and intercultural coherence

The application of Alexy's methodology in the field of global bioethics does not require cultural homogeneity, but rather argumentative coherence within a pluralistic framework. The principle of universalization demands that substantially similar cases receive solutions based on equivalent criteria, avoiding arbitrary decisions or those motivated by contextual biases. However, this universality does not imply ignoring cultural diversity: cultural specificities must be incorporated as part of the factual and contextual analysis, not as capricious exemptions that alter the global ethical standard.

Likewise, the final justification for the weighing of interests must be capable of standing up to scrutiny by any reasonable audience, regardless of its cultural or geopolitical position. This requirement strengthens the legitimacy of bioethical decisions in transnational settings and ensures that bioethical principles operate with intercultural consistency, without renouncing the recognition of differences.

In short, Alexy's theory provides global bioethics with an objective methodological framework for addressing dilemmas where dignity, justice, sustainability, vulnerability, and scientific uncertainty converge. Its tools —based on the principles of optimization, proportionality, justification, preservation of the essential core, universalization, and the weighting formula— enable the integration of bioethical principles into a rational, transparent, and replicable deliberative process. Thus, weighting becomes an instrument capable of harmonizing global values without sacrificing cultural pluralism, ethical coherence, or the normative rigor demanded by an interdependent and profoundly unequal world.

Taken together, the integration of general legal principles with the principles of global bioethics, through Robert Alexy's methodology, enables the construction of a solid analytical framework for addressing contemporary ethical dilemmas in a deeply interdependent world. The optimizing structure of the principles, the requirement of proportionality, the protection of the essential core, and the criterion of universalization offer a methodological architecture that harmonizes the normative dimension with intercultural sensitivity. This methodological convergence enables more coherent, transparent, and justifiable ethical decisions, capable of addressing the complexity of conflicts where human dignity, global justice, sustainability, vulnerability, and scientific uncertainty converge. In doing so, global bioethics is strengthened as a normative and practical field that not only describes problems but also proposes rigorous paths for their resolution, paving the way for the article's final conclusions.

8. Conclusions

The reflection developed throughout this article has allowed us to argue that global bioethics, as a field of ethical principles aimed at addressing dilemmas in contexts of planetary interdependence, requires a solid, systematic, and justifiable methodology to guide

decisions that simultaneously affect individuals, communities, ecosystems, and future generations. The initial contextualization demonstrated that the traditional tools of biomedical bioethics are insufficient to address complex phenomena such as global inequality, the climate crisis, accelerated digitalization, cutting-edge biotechnology, or transnational health governance, all of which require the integration of ethical, legal, social, and environmental dimensions, as well as mechanisms for public justification and intersubjective control of decisions.

Based on this analysis, the article examined the general principles of law, their optimizing nature, their interpretive and integrative function, and their capacity to guide decisions in conflict scenarios. Furthermore, it demonstrated that these principles share a normative and axiological structure nearly identical to the fundamental principles of global bioethics, as identified by authors such as Ten Have and in guiding documents such as the Universal Declaration on Bioethics and Human Rights. Thus, principles such as dignity, vulnerability, global justice, solidarity, sustainability, precaution, or social responsibility function as open, adjustable, and context-sensitive optimization mandates, making them particularly well-suited for weighing.

This structural convergence justified the incorporation of Robert Alexy's theory of principles as an applicable and fruitful methodology for global bioethics. Proportionality, with its three sub-principles—the weighting formula, the protection of the essential core, and the requirement for justification—along with universalization and intercultural coherence, allows bioethical principles to be translated into clear and replicable deliberative criteria capable of resolving tensions between values and goods in complex scenarios without sacrificing either normative rigor or cultural sensitivity. Alexy's methodology also provides a common language that facilitates dialogue among ethics committees, courts, international organizations, and political actors, preventing decisions from being reduced to mere moral intuitions or opaque technocratic calculations.

Finally, it was demonstrated that this methodological framework enables a fairer, more transparent, and more rational resolution of global dilemmas, providing an operational tool for integrating cultural plurality with universal ethical standards.

This work therefore concludes with a proposal for an Alexian-inspired methodology for global bioethics, conceived as a bridge between law and applied ethics; aimed at offering coherent guidelines for decision-making in a world marked by interdependence, vulnerability, and shared challenges. To that extent, the proposal does not aim to close the debate, but rather to offer a common ground from which bioethical decisions can be discussed, critiqued, and reviewed in a public and argumentative manner.

This establishes a methodological path that seeks to strengthen global bioethics' capacity to move from describing problems to constructing sound, justified, and applicable ethical solutions, opening new possibilities for future research and for the development of deliberative tools in transnational settings.

References

1. UNESCO. *¿Por qué una Bioética Global? Vigésimo aniversario del Programa de Bioética de la UNESCO*. París: UNESCO; 2015.
2. Potter VR. *Global Bioethics: Building on the Leopold Legacy*. Michigan: East Lansing: Michigan State University Press; 1988.
3. Callahan D. *Bioética: pasado y futuro*. En: UNESCO. *¿Por qué una Bioética Global?* París: UNESCO; 2015.
4. Ruger JP. *Global Health Justice and Governance*. Oxford: Oxford University Press; 2018.
5. Luna F. *Bioética: nuevos problemas y nuevas miradas*. Buenos Aires: Paidós; 2020.
6. Blasco I. *Epistemologías plurales y justicia cognitiva en ética global*. *Journal of Global Ethics*. 2021.
7. de Sousa Santos B. *Epistemologías del Sur: justicia contra epistemicidio*. Madrid: AKAL; 2018.
8. Durkheim É. *Las reglas del método sociológico*. Madrid: Alianza Editorial; 2007.
9. O'Neill O. *Justice Across Boundaries: Whose Obligations?* Cambridge: Cambridge University Press; 2016.

10. Macklin R. *Global Health Ethics*. En: *Global Health Ethics*. New York: Oxford University Press; 2019.
11. Atienza M. *El derecho como argumentación*. 3ª ed. Barcelona: Ariel; 2017.
12. MacCormick N. *Legal Reasoning and Legal Theory*. Oxford: Clarendon Press; 1978.
13. Ferrajoli L. *Derechos y garantías: la ley del más débil*. Madrid: Trotta; 2001.
14. Alexy R. *Teoría de los derechos fundamentales*. Madrid: Centro de Estudios Constitucionales; 1993.
15. Raz J. *The Morality of Freedom*. Oxford: Oxford University Press; 1986.
16. Lacey N. *Unspeakable Subjects: Feminist Essays in Legal and Social Theory*. Oxford: Hart Publishing; 1998.
17. Corte Interamericana de Derechos Humanos. *Caso Gelman vs. Uruguay*. Sentencia de 24 de febrero de 2011.
18. Comité de Derechos Humanos. *Observación General N° 31: La naturaleza de la obligación jurídica general impuesta a los Estados Partes del Pacto*. Naciones Unidas; 2004.
19. Cañado Trindade AA. *El principio pro-persona: desarrollo jurisprudencial y proyección en el derecho internacional contemporáneo*. México: Comisión Nacional de los Derechos Humanos (CNDH); 2013.
20. Fix-Zamudio H. *Ensayos sobre la protección jurídica de los derechos humanos*. México: UNAM; 2007.
21. García Ramírez S. *El control judicial de la convencionalidad*. México: Porrúa; 2011.
22. Ferrer Mac-Gregor E. *El principio pro-persona y la reforma constitucional en México*. México: IIJ-UNAM; 2014.
23. Dworkin R. *Taking Rights Seriously*. Cambridge: Harvard University Press; 1977.
24. Nussbaum M. *Creating Capabilities*. Cambridge: Harvard University Press; 2011.
25. Suprema Corte de Justicia de la Nación. *Amparo en Revisión 953/2019*. 6 de mayo de 2020.
26. Atienza M. *El Derecho como argumentación*. Madrid: Trotta; 2013.
27. Bobbio N. *Teoría general del Derecho*. Madrid: Debate; 1991.
28. Serna P. *Sobre principios y reglas. Problemas del razonamiento jurídico*. Madrid: Trotta; 2003.
29. Atienza M, Ruiz Manero J. *Las piezas del Derecho. Teoría de los enunciados jurídicos*. Barcelona: Ariel; 1996.
30. Zagrebelsky G. *El derecho dúctil: Ley, derechos, justicia*. Madrid: Trotta; 1995.
31. Corte Interamericana de Derechos Humanos. *Caso Velásquez Rodríguez vs. Honduras*. Sentencia de 29 de julio de 1988.
32. Comité de Derechos Humanos. *Observación General N.º 31: La naturaleza de la obligación jurídica general impuesta a los Estados Partes del Pacto*. Naciones Unidas; 2004.
33. *Convenio de Basilea sobre el control de los movimientos transfronterizos de los desechos peligrosos y su eliminación*. Basilea; 1989.

34. Naciones Unidas. Declaración de Río sobre Medio Ambiente y Desarrollo. Río de Janeiro; 1992.
35. Naciones Unidas. Protocolo de Cartagena sobre Seguridad de la Biotecnología del Convenio sobre la Diversidad Biológica. Montreal; 2000.
36. Naciones Unidas. Convención Marco de las Naciones Unidas sobre el Cambio Climático. New York; 1992.
37. Comisión Mundial sobre Medio Ambiente y Desarrollo. Our Common Future. Oxford: Oxford University Press; 1987.
38. Engelhardt HT. Global Bioethics: An Introduction. London: Routledge; 2016.
39. UNESCO. Declaración Universal sobre Bioética y Derechos Humanos. París: UNESCO; 2005.
40. Anaya AM. Los desafíos de una bioética global: entre pluralismo, justicia y crítica epistémica. *Revista Colombiana de Bioética*. 2020;15(2).
41. Bernal Pulido C. El principio de proporcionalidad y los derechos fundamentales. 9ª ed. Madrid: Centro de Estudios Políticos y Constitucionales; 2019.
42. Corte Interamericana de Derechos Humanos. Caso Atala Riffo y Niñas vs. Chile. Sentencia del 24 de febrero de 2012.